CHASSIS 11AK08

SERVICE MANUAL

FOR ALL MODELS

CONTENTS

PAGE NO

- PERI-TV SOCET 1
- INTRODUCTION 2-5
- SPECIFICATIONS 6
- SERVICING ADJUSTMENT AND ALIGNMENTS 7-8
- MAIN CHASSIS PLUG IDENTIFICATION, SETTING AND MEASUREMENT POINT 9
- SETTING AND MEASUREMENT POINTS FOR MODULES 10
- MAIN PCB FAULT FINDING GUIDE 11
- GENERAL BLOCK DIAGRAM OF CHASSIS 11AK08 12
- IC DESCRIPTIONS AND INTERNAL BLOCK DIAGRAMS 13-32
- ELECTRONIC COMPONENTS PART LIST 33-35
- 11TP09D-2 CRT MODULE COMPONENTS USED FOR 14-15" CRT MODULE 36
- CIRCUIT DIAGRAM AND LAYOUT 37

DO NOT CHANGE ANY MODULE UNLESS THE SET IS SWITCH OFF.

The mains supply side of the switch mode power supply transformer is live. Use an isolating transformer.

The receivers fulfill completely the safety requirements.

Safety precautions

Servicing of this TV should only be carried out by a qualified person.

- Components marked with the warning symbol on the circuit diagram are critical for safety and must only be replaced with an identical component.
- Power resistor and fusable resistors must be mounted in an identical manner to the original component.
- When servicing this TV, check that the EHT does not exceed 26KV

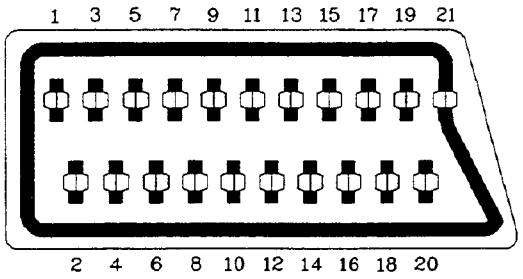
TV set switched off:

Make short-circuit between HV-CRT clip and CRT ground layer
Short C808 (100μF) before changing IC801 or other components in primary side of SMPS.

Measurements

Voltage readings and oscilloscope traces are measured under following conditions.
Antenna Signal 60dBuV from colorbar generator. (100% white, 75% color saturation)
Brightness, contrast, color set for a normal picture
Mains supply, 220V AC, 50Hz.

PERI-TV SOCKET



1	AF right output	0.5Vrms / 1K
2	AF right output	0.5Vrms / 10K
3	AF left output	0.5Vrms / 1K
4	Ground AF	
5	Ground blue	
6	AF left input	0.5Vrms / 1K
7	Blue input	0.7Vpp / 75
8	AV switching input	9.5-12Vdc / 10
9	Ground green	
10		
11	Green input	0.7Vpp / 75
12		
13	Ground red	
14	Ground blanking	
15	Red input	0.7Vpp / 75
16	Blanking input	1-3Vpp / 75
17	Ground CVS output	
18	Ground blanking input	
19	CVS output	1Vpp / 75
20	CVS input	1Vpp / 75
21	Ground	

1. INTRODUCTION

11AK08 is a 90 degree chassis capable of driving 14 and 15 inch tubes at appropriate beam currents. The chassis is capable of working in PAL. The sound system is capable of giving 1.5watts RMS output into a load of 16ohms.

One page simple TELETEXT is provided. The chassis is equipped with 21-pin scart connectors can accept via scart the SVHS format from VCRs so equipped.

2. SMALL SIGNAL PART WITH TDA8362A :

The TDA8362A combines all small signal functions required for a colour TV receiver, except tuning.

2.1. Vision IF amplifier, video demodulator and identification circuit :
The vision IF amplifier consists of three AC-coupled differential stages. The gain control per stage is more than 20dB, which results in a total gain control of 64dB min. The IF amplifier inputs can be coupled directly to the SAW filter output. The input impedance is 2 Kohm in parallel with 3pF. The input sensitivity for on-set of AGC is 70μV (typ.), for IF frequencies between 38.9MHz and 58.75MHz. The reference carrier for the video demodulator is obtained via passive regeneration of the picture carrier. The reference tuned circuit is connected between pin 2 and 3. The IC can handle positive and negative modulated signals, the polarity of the modulation can be switched at pin 1. A transmitter identification circuit operates independently of the synchronization circuit, to allow separate use of the front-end section and the display section of the TDA8362A. The output voltage at pin4 will be high with transmitter identification and low without identification (sound muted).

2.2. AGC , tuner AGC and AFC :
The AGC detector operates at top-synch level for signals with negative modulation and at peak-white level for positive modulated signals. For positive modulated signals the AGC time constant is long to avoid visible variations of the video output signal. To obtain an acceptable AGC speed with positive modulation an extra circuit checks whether the AGC detector is activated every frame period. The speed will be increased if this circuit detects that the video output signal has not reached 80% of peak white level for approximately 100ms. Externally a diode (D201) takes care that the tuner AGC voltage can be reduced rather quickly, which is only required if positive modulated signals have to be processed. The tuner AGC take-over point can be set by adjusting the DC voltage at pin 49, with a potentiometer of 10Kohm (VR402). The tuner AGC (pin 47) is an open collector output stage with an output swing of 2mA min. The voltage swing, required by the tuner, can be obtained with an external resistive network, connected at pin 47. Pin 47 may rise 2V above the actual supply voltage, without damaging the IC. This feature is provided because most tuners require a 9V AGC voltage level for min gain. The AFC circuit is driven by the same reference signal as the video demodulator. A sample and hold circuit avoids video break-through from the video demodulator to the AFC voltage. The AFC output voltage range is from 0 to Vcc.

2.3. Sound circuit :
The sound carrier which is present at the video output pin 7 is fed via the sound bandpass to the sound input at pin 5. This pin has a double function; sound IF input (AC) and volume control (DC). The filtered intercarrier signal is fed to an amplifier / limiter circuit and is demodulated by a PLL demodulator. This PLL demodulator tunes automatically to the incoming frequency, hence no alignment is required. The AF signal (pin 50) has an amplitude of 350 mV_{rms} at maximum volume control setting. The volume control setting is between 0 and 5V, volume control is logarithmic.
The deemphasis capacitor (C401) is connected externally at pin 1. The non-controlled audio signal (Peri-television) is also obtained from pin 1 via an amplifier stage (Q406). Audio input signal from an external source (SCART) with an amplitude up to 350m V_{rms} (+/- 6dB) can be fed to pin6. The audio switch is controlled via the chroma input pin 16, as described in Chapter 8. The volume control operates upon the external audio input signal, when the TDA8362A is switched to the external mode.

2.4. Horizontal and vertical synchronization :
The incoming video signal, pin 13 for the internal signal and pin 15 for an external CVBS signal, is fed to the synchronization seperator circuit. Internally the black level and the top synch level are detected, next the synchronization pulses are amplified to a fixed level and sliced at 50% of that level. The separated synchronization pulses are fed to the first phase detector circuit and to the coincidence detector. The components which determine the loop gain of the first phase detector are connected at pin 40 (C422, C423 and R438). The coincidence detector is only used to detect whether the line oscillator is synchronised. When the IC is operating in internal mode, this information is fed to the ident pin as transmitter identification. The line oscillator is running at twice the line frequency and is derived from the X-tal oscillator frequency of the colour decoder, consequently no adjustment is required. The second phase detector generates the pulses for the horizontal driver stage (pin 37). The loop filter capacitor (C424) is connected at (pin 39). Horizontal shift can be obtained by a potentiometer (VR401), a series resistor (R440) and a pull-up resistor (R429) connected at pin 39.

The TDA8362A has a separate start-up circuit for the horizontal oscillator (pin 36). The vertical drive pulses (pin 44) are generated by a divider circuit. The vertical ramp generator components are connected at pin 43. AC and DC feedback voltage from the vertical deflection stage must be connected at pin 42.

2.5. Integrated video filters :
The TDA8362A has an alignment-free internal chroma bandpas sand trap circuit. These filters are realised by means of gyrator circuit and they are tuned by tracking to the frequency of the X'tal controlled oscillator. The luminance delay is also realised by gyrator circuits. For SECAM an extra delay is built-in to adjust for the correct delay of the luminance signal.

2.6. Colour decoder :
The colour decoder contains an alignment-free X-tal oscillator, a dual killer circuit and the colour difference signals demodulators. The decoder adapts automatically for PAL and NTSC signals. Two X-tal pins are present so no external switching is required. With the SECAM add-on decoder TDA8395 an alignment free multi-standard decoder with automatic selection is built. The burst phase detector locks the X-tal oscillator with the burst signal.

2.7. RGB controller :
The colour difference signals are matrixed with the luminance signal to obtain RGB output signals (pin 18, 19 and 20). External RGB signals (pin 22, 23 and 24) coming from the Peri-television connector are interfaced by linear amplifiers. The contrast and brightness control and the peak white limiter operate on internal and external signals as well as RGB signals. The data insertion pin 21 has a second detection level at 4V. Above this level the RGB outputs are blanked. In this way OSD signals can be supplied directly to the inputs of the video output stages without any interaction to the RGB outputs of the colour decoder part of the TDA8362A. The output signal has an amplitude of about 2 V_{BL-WH} at nominal input signals and nominal control settings. The black current stabilisation is realized by means of a feedback from the video output amplifiers to the RGB output circuit.
The black current of the three guns of the picture tube is internally measured and stabilised.
The leakage current is measured during the first line and the following 3 lines, the 3 guns are adjusted to the required level. Maximum acceptable leakage current is +/- 100μA. The nominal value of the black current is 10μA. The maximum current that can be supplied to the measuring input (pin 14) is 250μA. The currents flowing into this pin will be higher during scan. For this reason, it is necessary that the excessive current is by-passed by means of an external clamping circuit.
A resistor in series (R473) and a capacitor (C410) are connected to pin 14. The black current stabilisation circuit is not activated when the TV receiver is switched on and the RGB outputs are blanked; contrast, brightness control pins are short circuited. Only during the measuring lines, the output will supply a voltage of 5 V to the video output stage so that it can be detected whether the picture tube is warming up. When the current supplied to the measuring input (pin 14) exceeds 190μA, the stabilisation circuit is activated and the contrast and brightness control pins are released. The switch-on behaviour of the picture is determined by the external time constant of the contrast control network.

2.8. Switches for external audio, CVBS and S-VHS signals :
The audio and CVBS switches are controlled via the chroma input pin 16, according to the following table :

Level pin 16	Int.CVBS	Ext.CVBS	Chroma	Chr.trap	Audio
DCV (INT.)	on	off	off	on	int.
3V S-VHS	off	on(Y)	on	off	ext.
DC7.5V (EXT.)	off	on(CVBS)	off	on	ext.

3. TUNER
Either a UHF-only TFK 3011 or a UHF/VHF 2000 KHC is used as tuner. The frequency range is

SYSTEM	C.C.I.R	
Channels	off-air	cable
VHF - LOW	51MHz to 65MHz	S1 to S6
VHF - HIGT	178MHz to 227MHz	S7 to S41
UHF	474MHz to 858MHz	-

The tuner has a voltage gain of approximately 40dB with a gain reduction capability of typically 40dB for band 1 and 3 and a minimum AGC of 30dB for band 4 and 5. It has a noise figure of typically 7dB for band 1 and 3, 8dB for band 4 and 9dB for band 5.

4. SECAM DECODER TDA8395 (FOR MODELS WITH SECAM SYSTEM ONLY)

The SECAM decoder TDA8395 which is used in conjunction with the TDA8362A includes the Cloche filter, demodulator and identification circuit. The resonance frequency of the Cloche filter is controlled during the calibration period and offset during scan for the right resonance frequency. The required reference frequency for calibration is connected at pin 1 and is obtained from the TDA8362A (pin 32). The two-level sandcastle pulse has to be connected at pin 15 (TDA8362A pin38) and is used for generation of the blanking periods and provides clock information for the identification circuit.

The chroma signal at pin 16 connected to pin 27 of the TDA8362A, is demodulated by a PLL demodulator, which uses the reference frequency and a band gap reference to force the PLL to the desired demodulation characteristic.

5. BASEBAND DELAY LINE TDA4661

The TDA4661 are integrated base band delay lines of 64uS for colour TV receivers. It is connected to the TDA8362A and TDA8395 without the need of switches and alignments. The TDA4661 consists of two main blocks:

- Two comb filters with a delay time of 64uS.
- Internal clock generation of 3MHz, line locked via the sandcastle pulse.

The TDA4661 operates according to the mode demanded by the colour transmission standard.In the PAL mode it operates as a geometric adder to satisfy the requirements of PAL demodulation and in the SECAM mode the delay line repeates the colour difference signal on consecutive horizontal scan lines.

6. VERTICAL OUTPUT STAGE WITH TDA3653B

The TDA3653B is a vertical deflection output circuit for drive of various deflection systems with currents up to $1.5A_{p-p}$. The output pin is pin 5. The output power transistors are protected by the cooperation of thermal protection circuit, the current-voltage detector, the short-circuit protection and the special measures in the internal circuit layout. Pin 1 is the input for the driver of the output stage. The signal at pin 1 is also applied via external resistors to pin 3 which is the input of a switching circuit. When the flyback starts, this switching circuit rapidly turns off the lower output stage and so limits the turn-off dissipation. The amplitude of the flyback voltage which is present at pin 8 is determined by the value of the external resistor at pin 8. When there is no deflection current and the flyback generator is not activated, the voltage at pin 8 reduces to less than 1.8V. The guard circuit will then produce a DC voltage at pin 7, which can be used to blank the picture tube and thus prevent screen damage. The internal voltage stabilizer provides a stabilized supply of 6V to drive the output stage, which prevents the drive current of the output stage being affected by supply voltage variations.

7. HORIZONTAL DEFLECTION STAGE

The horizontal drive pulses, from pin 37 of the TDA8362A, are connected to base of driver transformer Q601 via resistor R439. The base current of the driver transistor is supplied via R601 (pin 37 is an open-collector output). The driver transformer (TR601) drives the BU506D deflection transistor (Q602). TR602 is the EHT transformer. The 112V supply voltage for the transformer is connected at pin 3. TR602 generates the EHT-, focus- and G2- voltage, required by the picture tube. Furthermore the 200V supply and heater voltages are derived from this transformer. The beam current information from pin 7 of TR602 is used for reducing the contrast at too high beam currents, for stabilizing the voltages derived from the power supply and for stabilization of the vertical amplitude. The flyback voltage is AC-coupled and clipped between +8V and ground by diodes D601 and D602 to obtain a well-shaped flyback pulse for feedback to the TDA8362A (pin 38).

8. SOUND OUTPUT STAGE TDA2822M

TDA2822M is used as the AF output amplifier. It is supplied by +12V coming from a separate winding in the SMPS transformer. Pin 50 of the TDA8362 is AC-coupled to the input pin 7 of the TDA2822M via a resistor divider. Maximum audio output power for 1 KHz signal with 30% modulation is 1.5W.

9. MICROCONTROLLER (CTV322S, CTV422M)

A. CTV322S is a TV receiver control system using all the functions of a PCA84C641 microcontroller. The system has Voltage Synthesis Tuning (VST). Sound and picture are controlled by the five DACs of the PCA84C641. The system is independent of the TV transmission standards. Control of a four-page teletext decoder is an option in the basic system. A 2K memory which allows 90 programmes to be stored is used (IC1002).

CTV322S has the following features:
- Voltage synthesis tuning via a 14-bit DAC
- On-screen display
- Control of two transmission standards
- Direct control of four-page teletext decoder
- Full peri-TV switching

B. CTV422M is a TV receiver control system using all the functions of a PCA84C841 microcontroller. The system has Voltage Synthesis Tuning (VST). Sound and picture are controlled by the five DACs of the PCA84C841. The system is independent of the TV transmission standards. Control of a four-page teletext decoder is an option in the basic system. A 2K memory which allows 90 programmes to be stored is used (IC502).

CTV422M has the following features:
- Voltage synthesis tuning via a 14-bit DAC
- On-screen display
- Control of two transmission standards
- Direct control of four-page teletext decoder
- Full peri-TV switching

10. POWER SUPPLY (SMPS)

The DC voltages required at various parts of the chassis are provided by an SMPS transformer controlled by the IC TDA4605-2 which is designed for driving, controlling and protecting the switching transistor BUZ77B of SMPS. This transformer produces 115V for FBT input, 33V for tuning circuitry of microcontroller, 26V for vertical output (field scan) and for tuner and some other ICs and transistors. This 12V is also used to obtain 8V by means of the regultor LM7808 for TDA8362A and some other ICs and transistors and 5V is obfained from 12V out for controller.

11. CRT BASEBOARD

When RGB signals enter the input of the video amplifier stage (CRT baseboard), they are amplified by means of three symmetrical class-B type video amplifier stages. For this purpose, three BF869S high-voltage, video output power transistors are used. So, high gain-bandwidth product is achieved Furthermore, voltage changes at the outputs of amplifiers caused by temperature variations are compensated by means of an additional circuitry. Black current information (BCI) is send to TDA8362A (Refer to TDA8362A RGB).

12. TELETEXT BOARD

There is only one teletext options:
- Simple text (1 page) using SAA5254P/T

13. SECAM L/L' BOARD

SECAM L/L' system is one where the vision carrier is positive modulated, i.e. peak carrier is peak white. In negative modulation peak carrier is the synchronization level. SECAM L' also has the vision and sound carriers reversed on band 1. They are the same as other systems on band 3 and on UHF. This makes necessary the use of a frequency inverter which only operates on band 1 and this is done by the mixer part of the TDA5030. In case of SECAM L'also the AFC information has to be inverted. This is realised by an inverter circuit. The AM modulated sound signal is demodulated by TDA3843 and fed to the external audio input of TDA8362 and scart audio output. The required switching is done by HEF4053.

SPECIFICATIONS

POWER SUPPLIES

Nominal : 220-240V AC 50Hz. The chassis is fully mains isolated and is stabilized across mains voltage range from 175V to 265V for less than 0.75 % change in picture size. No mains input adjustment is required.

POWER CONSUMPTION
Typically : 50 W, Maximum : 70 W (for 14" and 15" models)

FREQUENCY COVERAGE
Hyperband (VHF CH 2 to UHF CH 69 including CATV) : 47-862 MHz

UHF (CH 21-69) : 471-862 MHz

SENSITIVITY
34 dBmV or less for any channel with a locked colour picture

MAXIMUM SIGNAL INPUT
95 dBmV or more for any channel

IF FREQUENCIES (in MHz)

	VISION	SOUND
B/G (EUROPE) :	38.9	33.4
I (UK) :	39.5	33.5
L' (FRANCE) :	32.7	39.2
L (FRANCE) :	39.2	32.7
D/K (RUSSIA)	38.0	31.5

AUDIO OUTPUT
Maximum : 1.5W RMS for 14" and 15" models
(At less than 10 % THD for 1 KHz, 30 % modulation factor)

BEAM CURRENT LIMITING
750 mA for 14" and 15" models

EHT
Maximum: 26 KV for 14" and 15" models

SERVICING ADJUSTMENTS AND ALIGNMENTS

The following preset adjustment procedures are not required during installation and should be made, if necessary, after servicing.

WARNING

EHT SHOCK HAZARD : The EHT must be safely discharged before attemping to disconnect the EHT lead from the tube anode.

Clip one end of a convenient lead, such as a meter lead, to the tube earthing strap on the tube body, fold back the suction cap and discharge the EHT through the lead. Press in one side of the spring clip which protects into the tube cavity to ease removal of the EHT connector.

IMPORTANT
Do not disturb the tube neck adjustments as these have been set for optimum performance during the tube manufacture.

Before attemping the following adjustments, the receiver should be tuned with the brightness, contrast and colour controls adjusted for the best picture and all measurements are to be made after a warm-up period of approximately 5 minutes, unless stated otherwise.
- 60 dBmV signal at any channel frequency
- Color bar pattern and 1KHz sound signal
- Mains 220-240V AC, 50Hz

The adjustments should be carried out in the following order for convenience.

SMPS SYSTEM VOLTAGE
1) Set the BCS (Brightness, Contrast, Saturation) and VOL (Volume) to minimum.
2) Check the voltage at the shorted pins of socket PL602 (TP1)
3) If necessary, adjust VR801 112 $\pm$0.5V_{DC} (14" and 15" models)
4) Set the BCS and VOL to normal picture and sound

VISION DEMODULATOR AND AFC
1) Set the pattern generator for 10mV, 38.9 MHz (B/G models) or 39.5 MHz (for I models) or 38.0 MHz (for D/K models) RF output
2) Connect the RF output of the pattern generator to any one input of SAW filter and connect the other input of SAW filter to ground through 10 nF capacitor (No antenna input applied)
3) Check the voltage at the base of Q201 (TP2)
4) Adjust VL401 for 3.5 $\pm$ 0.1 V_{DC}

2) PICTURE GEOMETRY AND FOCUS

1) Set the pattern generator for centre-cross, circle and cross-hatch composite pattern.
2) Adjust VR702 for vertical size, VR701 for vertical linearity, VR401 for horizontal centering and focus potentiometer (on EHT transformer) for optimum focusing.

TUNER AGC
1) Check the voltage at pin 1of TUNER (TP4)
2) Adjust VR402 for 1V less than maximum.

SCREEN VOLTAGE

1) Set the pattern generator for grey scale.
2) Set the BCS (Brightness, Contrast, Saturation) to minumum.
3) Measure cathode voltages on the CRT base board by using a 1/1000 probe.
4) Adjust screen pot of FBT for 175 ± 2V reading on maximum cathode voltage.

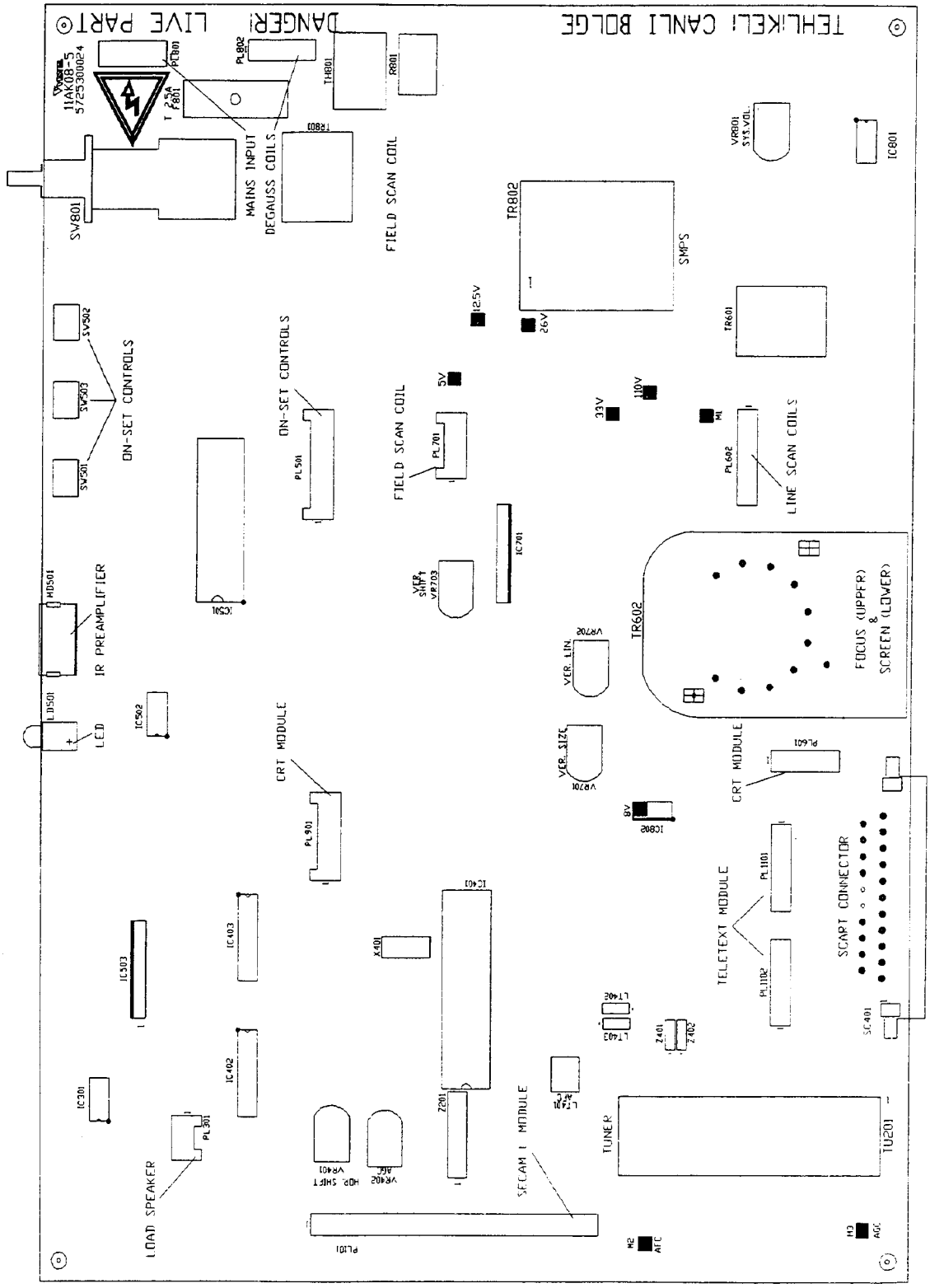
CRT BASEBOARD : CUT-OFF VOLTAGES AND WHITE BALANCE

1) Set the pattern generator for grey scale.
2) Set the BCS (Brightness, Contrast, Saturation) to minumum.

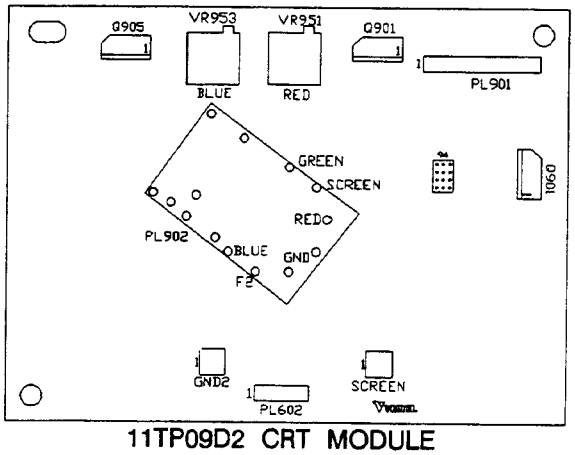
SECAM L MODULE (L/L' AND B/G) OR (L/L' AND K1) (11SL02)

1) Set the pattern generator for the coluor bar pattern at system PAL B/G and at frequency of 63.75MHz.
2) Tune the receiver for the best picture.
3) Switch pattern generator to system SECAM L and the receiver to SYS2 mode.
4) Connect the frequency counter to pin 13 of IC101.
5) Adjust VL101 for 72.3MHz reading and VR101 for no interference on the screen.

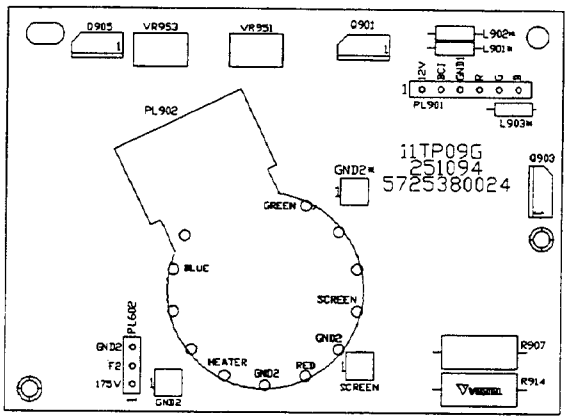
MAIN CHASSIS PLUG IDENTIFICATION, SETTING AND MEASUREMENT POINT



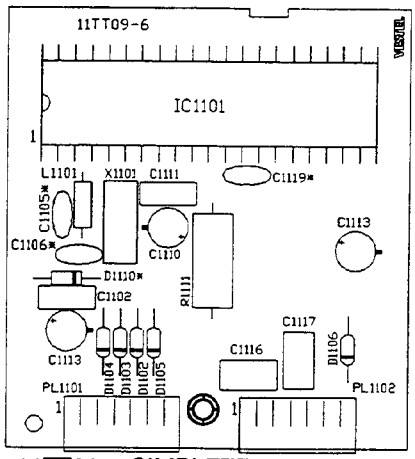
SETTING AND MEASUREMENT POINTS FOR MODULES



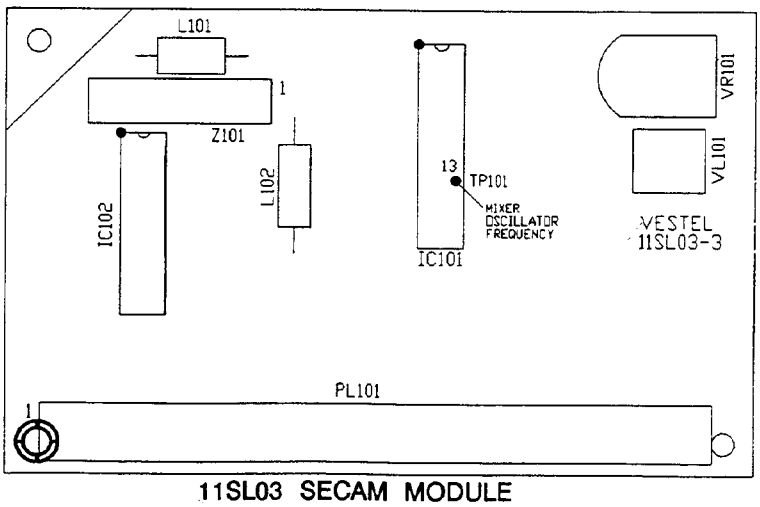
11TP09D2 CRT MODULE



11TP09G CRT MODULE



11TT09-6 SIMPLETEXT MODULE



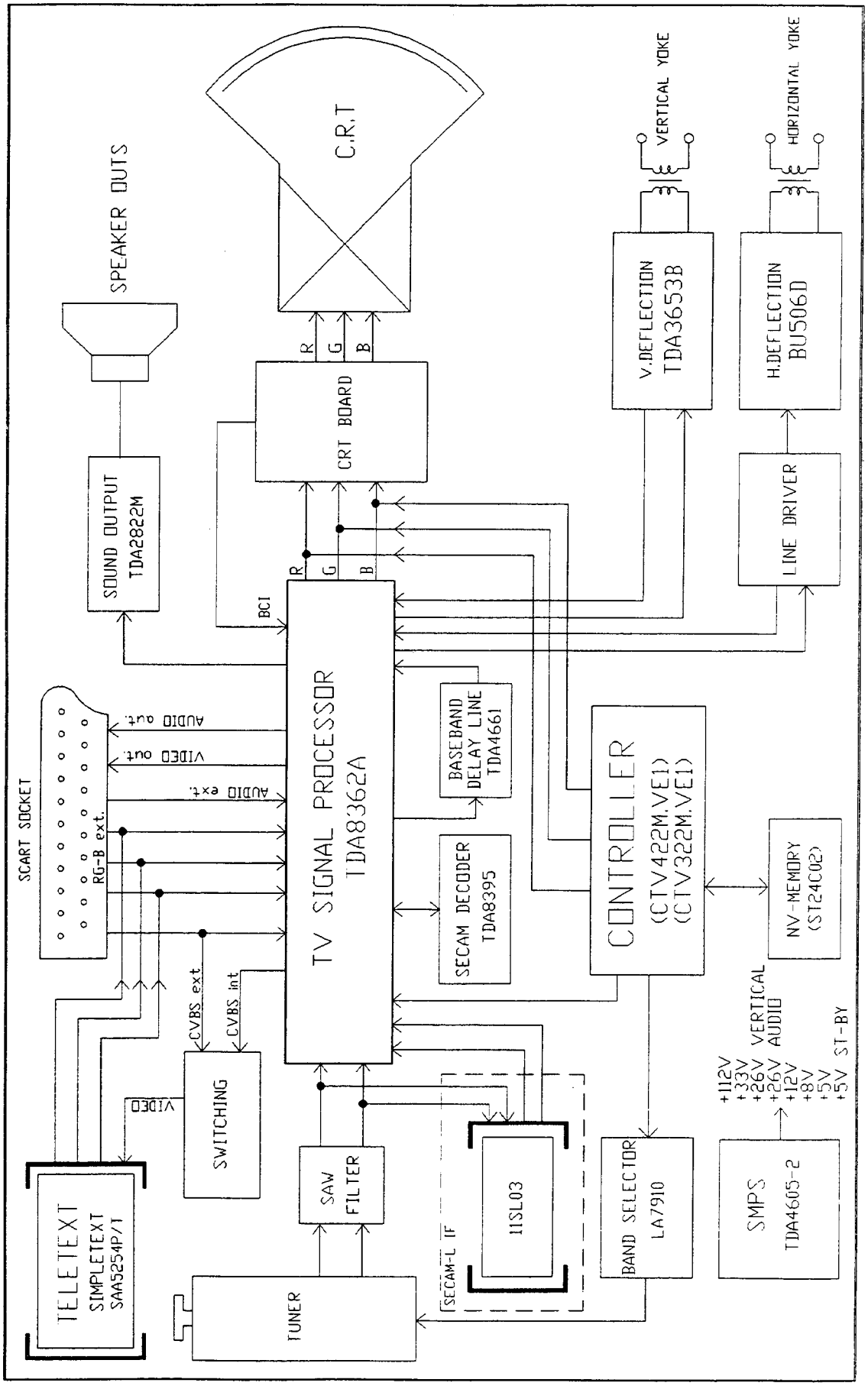
11SL03 SECAM MODULE

MAIN PCB FAULT FINDING GUIDE

AT FIRST CHECK ALL THE SUPPLY VOLTAGES, THEN CHECK FOLLOWING RELEVANT POINTS FOR TROUBLE SHOOTING. TROUBLES SHOULD BE THE SAME AT ALL CHANNELS.

TROUBLE	CHECK POINTS
NO PICTURE, NO SOUND	TUNER VOLTAGES, INPUT/OUTPUT SIGNALS OK Q401, IC401
NO PICTURE, SOUND OK	INT CVBS IN, IC401, SCREEN VOLTAGE
NO COLOUR	IC401, IC402, IC403, X401
NO VERTICAL DEFLECTION	26V, R711, PL701, IC701
VERTICAL LINEARITY	C705, VR701
VERTICAL SIZE	R704, VR702
VERTICAL SHIFT	VR703
VERTICAL FOLD	26V, R711
HORIZONTAL LINEARITY	L601, C606
HORIZONTAL SIZE	C603, SYSTEM VOLTAGE (112V)
HORIZONTAL FOLD	SYSTEM VOLTAGE (112V)
FLUE PICTURE	TR602, G3 (FOCUS), EHT, FLAMENT VOLTAGE
DARK PICTURE	TR602 G2 (FOCUS), BRIGNES, CONTRAST VOLTAGE
NOISY PICTURE	AGC VOLTAGE, RF SIGNAL
VERTICAL/HORIZONTAL SYNC.	IC401
INTERFERENCE	TUNER (TU201), Z201
NO SOUND	R303, IC401, (PIN5), IC301
LOW SOUND	IC401 (PIN5, SOUND CONTROL VOLTAGE), R303, IC301
SOUND DISTORTION	R303, IC301, 26V
POP NOISE	Q301, C307
CONTRAST	IC401 (PIN25)
BRIGHTNESS	IC401 (PIN17)
COLOUR	IC401 (PIN26)
AUTO TUNING	Q501
MEMORY	IC502
BAND SELECT	IC503
NO VIDEO AT SCART	SET AV MODE, CHECK IC401 (PIN5), (PIN6)
NO SOUND AT SCART	IC401 (PIN6)
MISSING CHARACTER AT TELETEXT	SIGNAL AT PIN8 OF IC101
REMOTE CONTROLLER	BATTERY, IR DIODE, CURRENT PATH OF IR DIODE

GENERAL BLOCK DIAGRAM OF CHASSIS 11AK08



IC DESCRIPTIONS AND INTERNAL BLOCK DIAGRAM

MAIN BOARD **PAGE NO**

- TDA8362A 14-15
- TDA4661 16
- TDA8395 17
- TDA3653B 18
- TDA4605-2 19
- PCA84C841 20-22
- ST24C02 23
- LA7910 24
- TDA2822M 25

SECAM BOARD

- TD5030A 26
- TDA9830 27

TELETEXT BOARD

- SAA5254P/T 28-29
- PCA84C641 / PCA84C444 30-32

TDA8362A

MONOLYTHIC INTEGRATED PAL / NTSC TV PROCESSOR

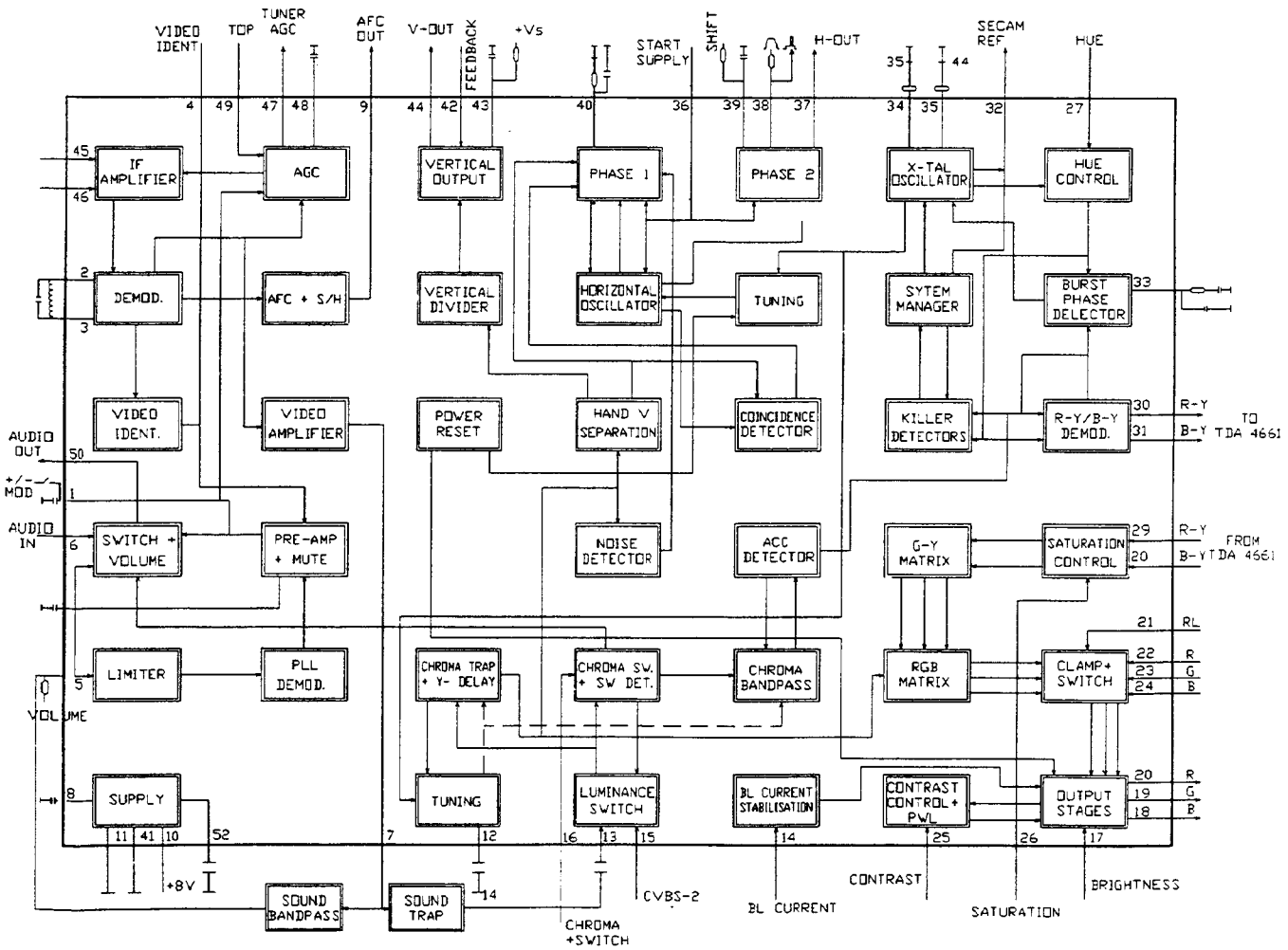
GENERAL DESCRIPTION : The TDA8362A is nearly identical to the TDA8362. The main difference between the 2 devices is that the TDA8362A contains a black-current stabilisation circuit. Because of the required input pin for the black-current stabilisation circuit the luminance peaking function has been omitted in the TDA8362A. All other functions of the 2 IC's are identical.

FEATURES :

- Multi-standard vision IF amplifier suitable for negative and positive modulation.
- Multi-standard FM sound demodulator (4.5MHz to 6.5MHz).
- Source selection for external A/V inputs (seperate Y/C signals can also be applied).
- Integrated chroma trap and bandpass filters (autocalibrated).
- Luminance delay line integrated.
- Alignment-free PAL/NTSC decoder with automatic search system.
- Easy interfacing with the TDA8395 (SECAM decoder) for multi-standard applications.
- RGB-control circuit with linear RGB inputs and fast blanking.
- Black-current stabilisation circuit.
- Horizontal synchronisation with two control loops and alignment-free horizontal oscillator without external components.
- Vertical count-down circuit (50/60Hz) and vertical pre-amplifier.
- Low dissipation (only 700mW).
- Only one adjustment (vision IF demodulator).

PINNING	PIN VOLTAGE
1- Audio deemphasis and +/- mod. switch	3V
2- IF-demodulator tuned circuit	6V
3- IF-demodulator tuned circuit	6V
4- Video indentification output	5V
5- Sound IF plus volume control	0.5V - 4V
6- External audio input	4V
7- IF video output	3.25V
8- Decoupling digital supply	1.8V
9- AFC output	-
10- Positive supply (8V)	8V
11- Ground	-
12- Decoupling filter tuning	3.25V
13- Internal CVBS input	4.25V
14- Black-current input	4V
15- External CVBS input	3.5V
16- Chroma + A/V switch input	0V (TV) - 8V (AV)
17- Brightness control input	1V - 3.5V
18- B-output	2.5V - 3.5V
19- G-output	2.5V - 3.5V
20- R-output	2.5V - 3.5V
21- RGB-insertion and blanking	-
22- R-input for insertion	3.3V
23- G-input for insertion	3.3V
24- B-input for insertion	3.3V
25- Contrast control input	0V - 3V
26- Saturation control input	0V - 3V
27- Hue control input (or chroma out)	6V
28- B-Y input signal	4V
29- R-Y input signal	4V
30- R-Y output signal	1.5V
31- B-Y output signal	1.5V
32- 4.43MHz output for TDA8395	1.6V (PAL) 4.5V (SECAM)
33- Loop filter burst phase detector	4.5V
34- 3.58MHz X-tal connrection	3V

35- 4.43MHz X-tal connection ..... : 2V
36- Start horizontal oscillator ..... : 8V
37- Horizontal output ..... : 0.6Vp-p 15.6 KHz
38- Flyback input / sandcastle output ..... : -
39- G2 loop filter ..... : 3V
40- G1 loop filter ..... : 3.75V
41- Ground ..... : -
42- Vertical feedback input ..... : 2.5V
43- Vertical ramp generator ..... : 2.5V
44- Vertical output ..... : 2.5V
45- IF-input ..... : 4V
46- IF-input ..... : 4V
47- Tuner AGC output ..... : -
48- AGC decoupling capacitor ..... : 4V
49- Tuner take-over adjustment ..... : -
50- Audio output ..... : 3.4V
51- Decoupling sound demodulator ..... : 4.5V
52- Decoupling bandgap supply ..... : 6.5V



BLOCK DIAGRAM OF TDA8362A

TDA4661

64 micro-second BASEBAND DELAY LINE

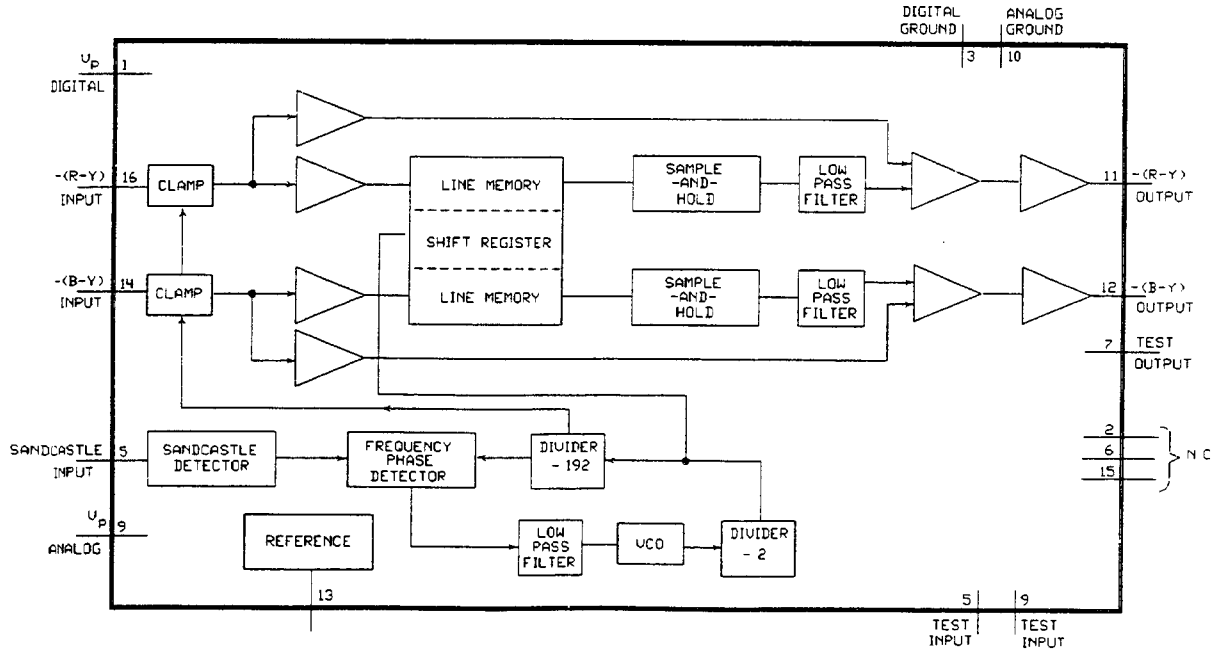
GENERAL DESCRIPTION: The TDA4661 is an integrated baseband delay line circuit. It provides a delay of 64ms for the colour difference signals. (R-Y) and (B-Y), in multi-standard TVs.
The colour difference signals are AC-coupled to pins 16 to 14 respectively and clamped at the input stages. The signals are then fed via buffers to the delay line circuit. The delay line circuit is driven by a 3MHz internal clock which enables the circuit to produce the required delay of 64ms.
The outputs from the delay line circuit are fed through sample-and-hold and low-pass filters to suppress the clock signal. The delayed and non-delayed are then added and fed to the output pins, 11 and 12, via buffers.
The internal clock is derived from a 6MHz voltage controlled oscillator (VCO) which is line-locked via a PLL to the sandcastle pulse at pin 5.

FEATURES :

- Two comp filters using the swiched-capacitor technique and with delay time of 64ms.
- Generation of a 3MHz internal clock that is line-locked via the sandcastle pulse.

PINNING — PIN VOLTAGE

1- Digital supply voltage ..... : 5V
2- Not connected ..... : -
3- Digital ground ..... : -
4- Test input ..... : -
5- Sandcastle input ..... : -
6- Not connected ..... : -
7- Test input ..... : -
8- Test input ..... : -
9- Analog supply voltage ..... : -
10- Analog ground ..... : -
11- -(R-Y) output ..... : 3.25V
12- -(B-Y) output ..... : 3.25V
13- Rreference current ..... : -
14- -(B-Y) input ..... : 1.35V
15- Not connected ..... : -
16- -(R-Y) input ..... : 1.35V



BLOCK DIAGRAM OF TDA4661

TDA8395

SECAM DECODER

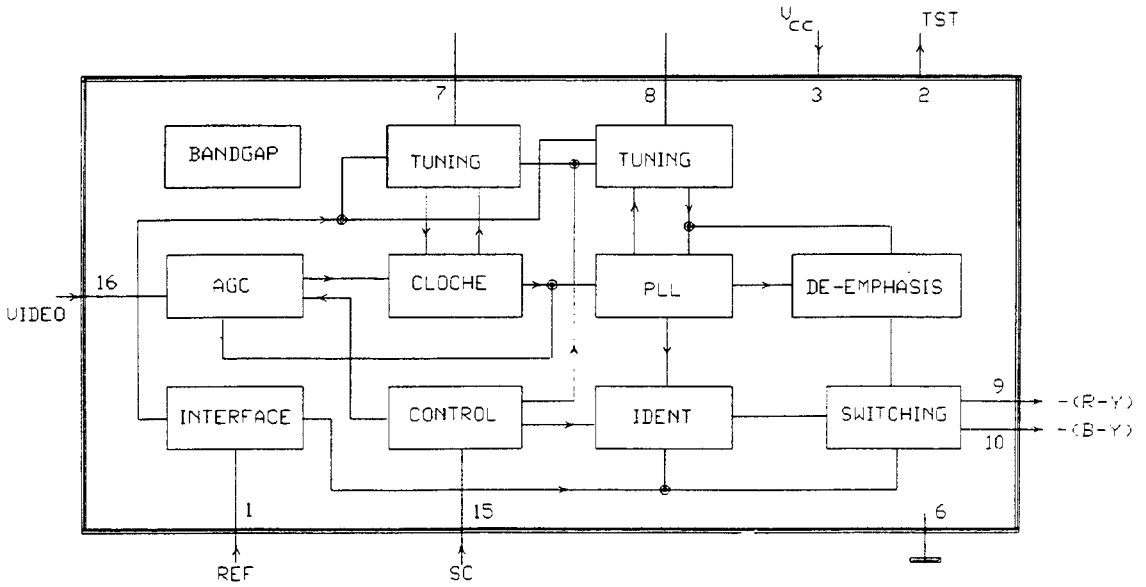
GENERAL DESCRIPTION: The TDA8395 is a self-calibrating, fully integrated SECAM decoder. It should preferably be applicated in combination with the PAL/NTSC decoder TDA8362 or TDA8366 and with the switched capacitor baseband delay TDA4661. It includes HF- and HF-filters, demodulator and identification. Luminance is not processed in this circuit. It needs no adjustments and very few external components. It needs very highly accurate reference frequency for calibration and a two-level sand-castle for blanking and burstgating.

FEATURES :

- Fully integrated filters
- Alignment free
- For use with baseband delay

PINNING — PIN VOLTAGE

1- Frequency referance ..... : 1.6V (PAL) 4.5V (SECAM)
2- TEST ..... : -
3- Supply Voltage ..... : 8V
4- NC. ..... : -
5- NC. ..... : -
6- Ground ..... : -
7- Cloche Reference ..... : 3.25V
8- PLL Referance ..... : 4.25V
9- Colour Difference Signal (R-Y) ..... : 1.5V
10- Colour Difference Signal (B-Y) ..... : 1.5V
11- NC. ..... : -
12- NC. ..... : -
13- NC. ..... : -
14- NC. ..... : -
15- Sandcastle ..... : -
16- Video input ..... : 5.5V



BLOCK DIAGRAM OF TDA8395

TDA3653B

VERTICAL DEFLECTION AND GUARD CIRCUIT

GENERAL DESCRIPTION: The TDA 3653B is a vertical deflection output circuit for drive of various deflection systems with currents up to 1.5 A peak-to-peak.

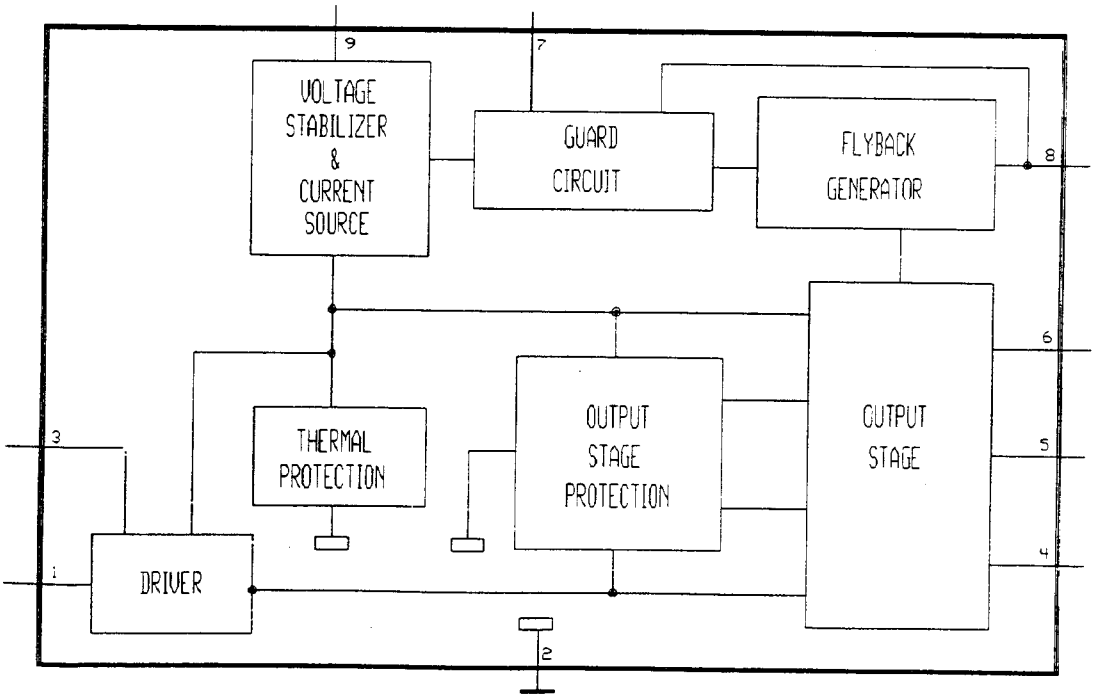
FEATURES:

- Driver
- Output stage
- Thermal protection and output stage protection
- Flyback generator
- Voltage stabilizer
- Guard circuit

PINNING

PIN VOLTAGE

1. Output Stage Driver Input ..... : 1.2V
2. Ground ..... : -
3. Switching Circuit Input ..... : 1.2V
4. Output Stage Ground ..... : -
5. Output Voltage ..... : 13V
6. Supply Voltage for the Output Stage ..... : 26V
7. DC Voltage produced by the Guard Circuit ..... : -
8. Flyback Generator Output ..... : 8V
9. Supply Voltage ..... : 26V



BLOCK DIAGRAM OF TDA3653B

TDA4605-2

SWITCH MODE POWER SUPPLY CONTROLLER

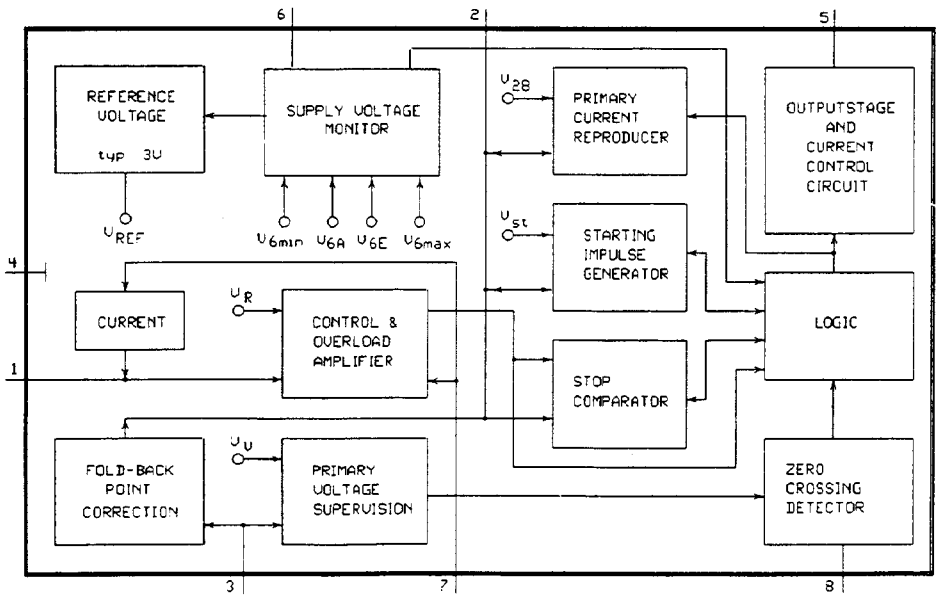
GENERAL DESCRIPTION: The TDA4605-2 is an integrated circuit designeted to regulate and control the power mosfet of a a switching power supply. Because of its wide operational range and high voltage stability even at high load changes, this IC can be used not only in TV receivers and video recorders but also in power supplies. HI-FI set and active speakers.

FEATURES:

- Fold-back characteristics provides overload protection for external components.
- Burst operation under secondary short-circuit condition implemented.
- Protection against open or a short of the control loop.
- Switch-off line voltage is too low (undervoltage switch-off).
- Line voltage depending compensation of foldback point.
- Soft-start for quite start-up without noise generated by the trasformer.
- Chip over-temperature protection (thermal shutdown).
- On-chip ringing suppression circuit against parasitic oscillations of the transformer.

PINNING

	PIN VOLTAGE ST-BY	NORM.
1. Information Input Concerning Secondary Voltage	0.4	0.4
2. Information Input Regarding the Primary Current	1	1.2
3. Input for Primary Voltage Monitor	2.1	2
4. Ground	0	0
5. Output	0.8	8
6. Supply voltage Input	12	12.8
7. Input for Soft-Start and Integrator Circuit	1.1	1.9
8. Input for the Feedback of the Oscillatore	0.3	0.4



BLOCK DIAGRAM OF TDA4605-2

PCA84C841

MICROCONTROLLERS FOR CTV 422M

GENERAL DESCRIPTION: CTV422M is a low cost television receiver control system, based on the PCA84C841 microcontroller. It is a voltage synthesis tuning (VST) system.
The control functions of the system are displayed via the on-screen display circuitry of the microcontroller. Herewith two independent lines of 16 characters with 4 different sizes and in 7 different colour can be displayed. Sound and picture are controlled by the 5 on-chip digital to analogue converters. This system is colour standard independent.
The PCA84C841 is a member of the MAB8400/PCF84C microcontroller family. It is a one-chip microcontroller with an 8-bit CPU, 8K ROM, 192 bytes RAM, 8-bit timer/event counter and single level, 3-source interrupt structure. It is mounted in a 42 pin shrunk DIL package. Manufactured in CMOS technology and operating from a single supply voltage between 3.5V and 5.5V, it runs at a 10MHz oscillation frequency and contains about 80 single and double byte and cycle instruction. Up to 19 general purpose bidiractional I/O lines and 9 I/O lines with a combained function are available. One 8-bit I/O port can sink up to 10mA and can therefore be used to drive directly a LED display.

FEATURES :

TUNING;

- Voltage synthesis tuning system via 14 bits digital to analogue convertor.
- Automatic search tuning based on analogue AFC signal and on IDENT (Video recognition) signal.
- Tuning in up to 4 different bands.
- Manual search tuning.
- Direct program number entry.
- One and two program number entry.
- Step program up and down.
- Silent tuning.
- Dark program switching.
- Automatic following per program.

CONTROL;

- Up to 28 local control commands.
- Remote control according the RC-5 world standart.

DISPLAY;

Off-screen LED display of stand-by mode.
On-screen display of :

- Menu operations.
- Remote control command reception.
- Two digit program number entry.
- Selected tuner band VHF-1, VHF-3, UHF and VHF-Hyper.
- Analogue tuning bar in search mode and manual/fine tuning.
- Selected external source.
- Store program mode.
- VRT time constand status.
- Selected colour standard mode.
- Sound mute.
- Analogue control mode: volume, brightness, saturation, contrast, and hue.
- Analogue control status bars.
- Selected sleep timer.
- Preduction Service Mode.

SOUND ;

- Volume control in 64 steps (8 steps/second).
- Mono only configuration.
- Mute control function.
- Automatic sound muting during tuning or program switching.

VIDEO ;

- Control of brightness, saturetion, contrast and hue in 64 steps (8 steps/second).
- Colour standart control of two different standards.
- VTR time constand control.
- Additional three button control possibility for all analogue colour and sound controls.

PERI-TV ;

- Peripheral source selection via program up/down commands.
- Full peripheral TV plug signal switching: CVBS out, CVBS/RGB in, sound in and out.

MEMORY ;

- Automatic storage of preferred analogue picture and sound control setting.
- Storage of 40 or 90 preferred programs.
- Storage of 14 bit tuning DAC value, band select, system standard, following enable and VTR time constand control bits for each program.
- Storage VTR time constant system selection for peripheral audio/video source.

OPTIONS ;

- Theree band, four band or UHF-only tuner.
- Different tuner and AFC characteristics.
- Peripheral audio/video TV plug control.
- Signal/Dual system standard control.
- VTR time constand control.
- 40 or 90 pre-programmed preferred channels, requiring 128 bytes or 256 bytes of NV=memory.
- AC mains supply control via selenoid on mains switch.
- Analogue control of hue.
- On Screen Display in symbols or text strings with or without background.

POWER-ON ;

- Main switch sense input to check whether TV has to be switched-on or to standby mode.
- The program provides a fixed delay of 1.2 seconds and screen blanking about 100 msec to allow to switch-mode power-supply to stabilize.
- After power-on reset of the microcontroller and first time switching-on of the set, the system tunes to program 1 and recalls analogue picture and sound control presets from non-volatile memory.

STANDBY ;

- Sleep timer selection of 15, 30, 45, ... up to 120 minutes.
- Automatic switching to standby mode when the system is in front-end mode and during the last five munites no valid input signal is received or no valid remote or local control command is detected. (All complete received commands with system address 00, except the "RC-5 enlarged" commands, will restrart the 5 minutes timer. All these commands will also result in an OSD message).
- With additional hardware it is possible to switch off the mains supply voltage completely, e.g. via a solenoid

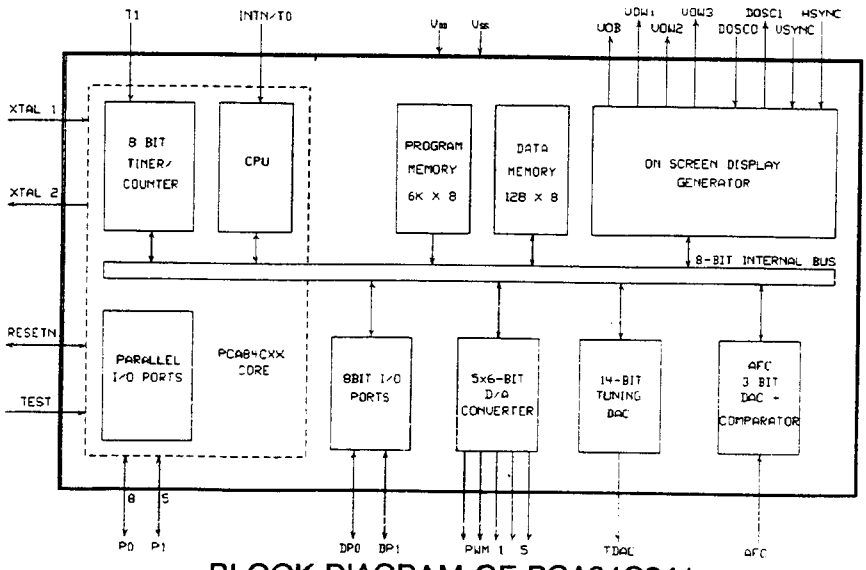
PRODUCTION SERVICE MODE :

- CTV422M VE1 has been provided with a special production Service Mode which disables the automatic switch off after 5 minutes if mode IDENT is available. This mode can be activated using RC-5 command O with sistem address 7. Program numbers and peripheral audio/video source designators will appear in green instead of yellow. This mode is implemented particularly for factory burn-in tests..

TELETEXT (These functions only for CTV422M) :

- Either : a 1 page teletext control system by means of SAA5254. All normal teletext function are available. A special signal for de-interlace purposes is available on a sigle output pin.
- Or : a 4 page teletext control system with SAA5246. All normal teletext functions are available Also here a special signal for de-interlace purposes is available on a single output pin.

PINNING	PIN VOLTAGE
1- Tuning voltage control output	: 5V(Front of band) 0V (End of band)
2- Volume control output	: 0 - 5V
3- Brightness control output	: 0 - 5V
4- Colour control output	: 0 - 5V
5- Contrast or hue control output	: 0 - 5V
6- Tone, balance or hue control output	: -
7- Band-switch 0 output	: -
8- Band-switch 1 output	: -
9- Analogue AFC sense input	: 2-4V
10- Dual/Non Dual language sound input	: -
11- VTR time constand control output	: -
12- Ext./int. audio/video source control output	: 5V (TV) - 0V (AV)
13- Keyboard scan line input/output	: -
14- Keyboard scan line input/output	: -
15- Keyboard scan line input/output	: -
16- Keyboard scan line input/output	: -
17- Keyboard scan line input/output	: -
18- Keyboard scan line input/output	: -
19- Keyboard scan line input/output	: -
20- System mode strobe output	: 5V
21- Ground supply input	: -
22- OSD red output	: -
23- OSD green output	: -
24- OSD blue output	: -
25- OSD fast blanking output	: -
26- Horizontal synchronization input	: -
27- Vertical synchronization input	: -
28- LC oscillator input for OSD	: 5V
29- LC oscillator output for OSD	: 5V
30- Test input; connected to ground	: -
31- Oscillator input; 10MHz crystal	: -
32- Oscillator output	: 2V
33- Power-on reset input/output	: 5V
34- Horizontal coincidence input	: 4.5V
35- RC-5 remote control input	: 4V
36- Mono/Stereo or language 1/2 output	: -
37- Sound effect control output	: -
38- System select output	: -
39- I^2C-bus clock signal output	: 5V
40- I^2C-bus data signal output	: 5V
41- Standby/On control input/output	: 0V (ST-BY) - 5V (OPEN)
42- +5V supply voltage input	: 5V



BLOCK DIAGRAM OF PCA84C841

LA7910

TV TUNER BAND SELECTOR

GENERAL DESCRIPTION: The LA7910 is an IC for tuner band selection of electronic tuning type television set. This IC is used for producing the VHF channel "L" band power supply, VHF channel "H" band power supply, UHF channel power supply for tuner and the CAPT power supply according to the band select signal of 2 inputs.

FUNCTIONS :

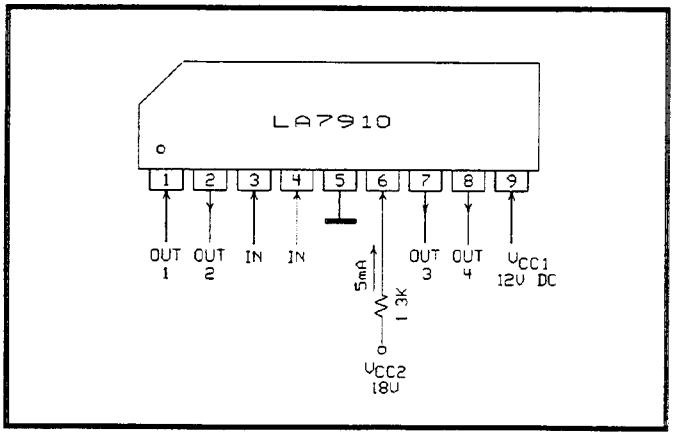
- VHF "L" band power supply output
- VHF "H" band power supply output
- UHF power supply output
- CATV power supply output

FEATURES

- 2 inputs and 4 outputs
- Low output saturation voltage : 0.25V typ., $I_O = 60mA$
- Compact 9-pin single-end package

PINNING

	PIN VOLTAGE			
	WHF-L	VHF-H	UHF	CATV
1- Output :	12	0	0	0
2- Output :	0	12	0	0
3- Input :	0	1	0	0
4- Input :	0	0	1	1
5- Ground :	-	-	-	-
6- Supply voltage (18V) :	13.5	13.5	13.5	13.5
7- Output :	0	0	12	0
8- Output :	0	0	0	12
9- Supply voltage (12V DC) :	12	12	12	12



BLOCK DIAGRAM OF LA7910

ST24C02

2K CMOS Serial Electrically Erasable PROM

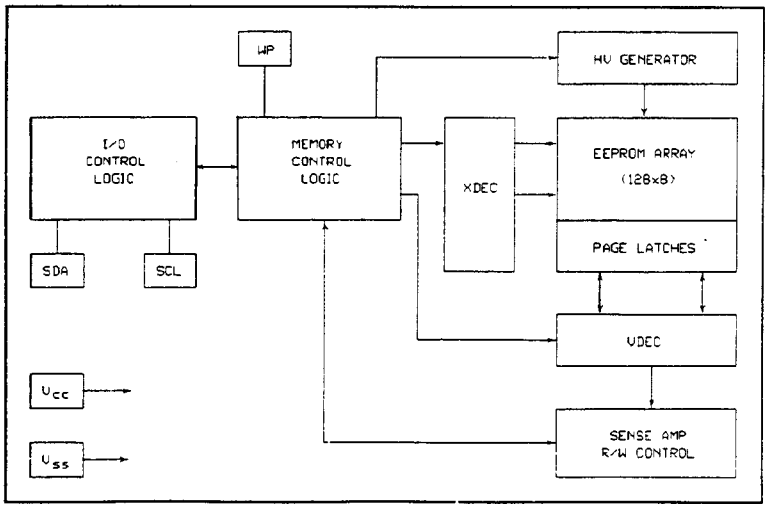
GENERAL DESCRIPTION: The 24LC02B is 2K bit Electriically Erasable PROM. The device is organized as a single block of 128x8-bit or 256x3-bit memory with a two wire serial interface. Low voltage desing permits operation down to 2.5 volts with a standby and active currents of only 5mA and 1mA respectively. The 24LC02B also has page-write capability for up to 8 bytes of data.

FEATURES :

- Single supply with operation down to 2.5 volts
- Low power CMOS technology
  - 1mA active current typical
  - 10mA standby current typical at 5.5V
  - 5mA standby current typical at 3.0V
- Organized as a single block of 128 bytes (128x8) or 256 bytes (256x8)
- Two wire serial interface bus
- 100KHz and 400KHz compatiblity
- Self-timed write cycle (including auto-erase)
- Page-write buffer for up to 8 bytes
- 2ms typical write cycle time for page-write
- Hardware write protect for entire memory
- Can be operated as a serial ROM
- Factory programming (OTP) available
- ESD protection > 4.000V
- 1.000.000 ERASE/WRITE cycles (typical)
- Data retention > 40 years
- 8-pin DIP or SOIC package
- Available for extended temperature ranges
  - Commercial : 0'C to + 70'C
  - Industrial : -40'C to + 85'C

PINNING — PIN VOLTAGE

1. 90 Program ..... : 5V
2. No Connection ..... : 0V
3. No Connection ..... : 0V
4. Ground ..... : 0V
5. Serial Address/Data I/O ..... : 5V
6. Serial Clock ..... : 5V
7. Write protect input ..... : 5V
8. +2,5V to 5.5V Power supply ..... : 5V



BLOCK DIAGRAM OF ST24LC2B

TDA2822M

DUAL POWER AMPLIFIER

GENERAL DESCRIPTION: The TDA2822M is a monolithic integrated circuit in 8 lead Minidip package. It is intended for use as dual audio power amplifier in portable cassette players and radios.

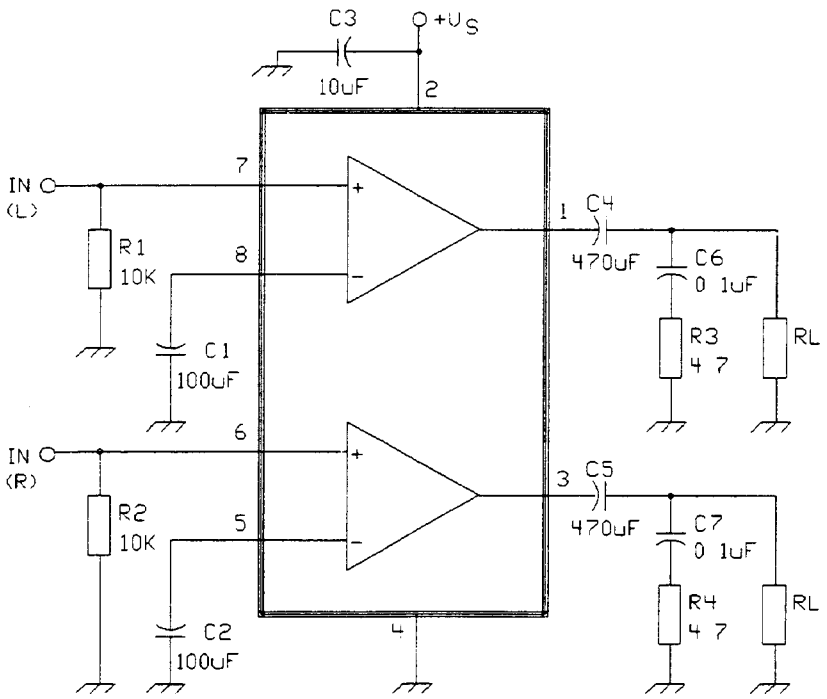
FEATURES :

- Supply voltage down to 1.8V.
- Low crossover distortion.
- Low quiescent current.
- Bridge or stereo configuration.

PINNING

PIN VOLTAGE

	SOUND MAX.	SOUND MIN.
1. OUTPUT (1)	: 4V	5.6V
2. SUPPLY VOLTAGE	: 8.6V	12V
3. OUTPUT (2)	: 4V	5.6V
4. GROUND	: 0V	0V
5. INPUT - (2)	: 0.4V	0.45V
6. INPUT + (2)	: 0V	0V
7. INPUT + (2)	: 0V	0V
8. INPUT - (1)	: 0.4V	0.46V



BLOCK DIAGRAM OF TDA2822M

TDA5030A

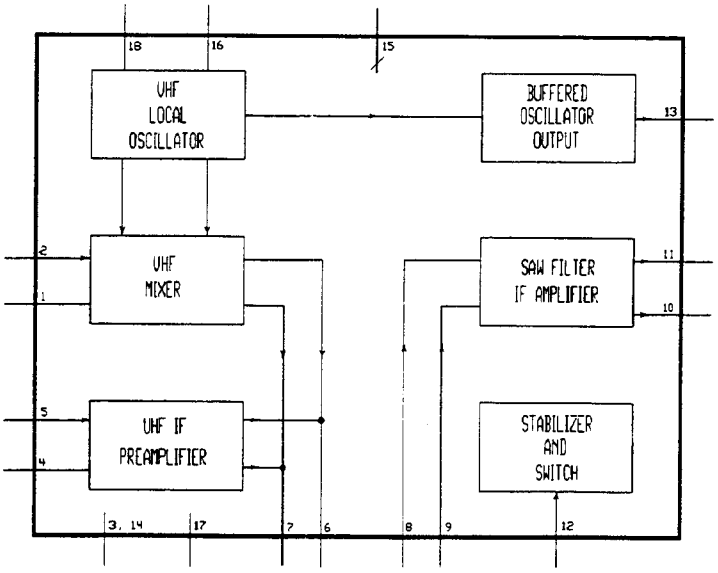
TV VHF MIXER/OSCILLATOR/UHF PREAMPLIFIER

GENERAL DESCRIPTION: The TDA 5030A provides VHF local oscillator, VHF mixer and UHF IF preamplifier functions for VHF/UHF television receivers. It includes a buffered output from the VHF local oscillator, a VHF/UHF switching circuit and an IF amplifier stage for an external SAW filter.

FEATURES:

- Balanced VHF mixer
- Voltage controlled VHF local oscillator
- IF amplifier for SAW filter
- UHF IF preamplifier
- Local oscillator buffer output for external prescaler
- Voltage stabilizer
- UHF/VHF switching circuit
- Electrostatic discharge protection diodes at pins 10, 11, 12 and 13

PINNING	PIN VOLTAGE
1. VHF Mixer Input	2.5V
2. VHF Mixer Input	2.5V
3. Ground	0V
4. UHF IF Preamplifier Input	6.30V
5. UHF IF Preamplifier Input	6.30V
6. VHF Mixer Output	7.80V
7. VHF Mixer Output	7.80V
8. SAW Filter IF Amplifier Input	3.50V
9. SAW Filter IF Amplifier Input	3.50V
10. SAW Filter IF Amplifier Output	5.40V
11. SAW Filter IF Amplifier Output	5.40V
12. UHF/VHF Switch	0V
13. Local Oscillator Output	1.256V
14. Ground	0V
15. Supply Voltage	12V
16. VHF Local Oscillator	1.5V
17. Mixer Balancing	6V
18. VHF Local Oscillator	2V



BLOCK DIAGRAM OF TDA5030A

TDA9830

AM DEMODULATOR

GENERAL DESCRIPTION:

The TDA9830, a monolithic integrated circuit, is designed for AM-sound demodulation used in L and L' standard. The IC provides an audio source selector and a mute switch.

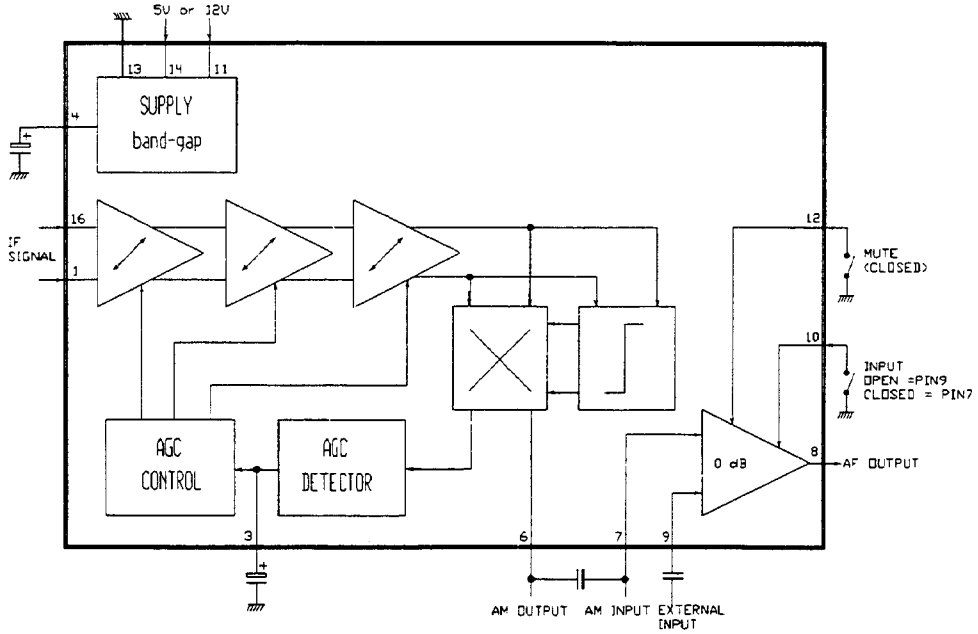
FEATURES

- Adjustment free wideband synchronous AM demodulator.
- Audio source-mute switch (Low noise).
- Audio level according EN50049.
- 5 to 8V power supply or 12V alternative.
- Low power consumption.

PINNING

PIN VOLTAGE

	SECAM L	PAL B/G
1. Sound IF differential input signal	1.75V	1.7V
2. NC	0V	0V
3. AGC capacitor	1.9V	2V
4. REF Voltage filtering capacitor	4.35	4.35
5. NC	0V	0V
6. AM demodulator output	2.2V	2.2V
7. Input signal (from AM) to audio switch	2.2V	2.2V
8. Output signal from audio switch	2.2V	2.2V
9. Input signal (from external) to audio switch	2.2V	2.2V
10. Switch input select control	0.12V	7.7V
11. Supply Voltage +12V (alternative)	7.3V	7.32V
12. Mute control	7.86V	7.86V
13. Ground	0V	0V
14. Supply Voltage +5V to +8V	7.86V	7.86V
15. NC	0V	0V
16. Sound IF differential input signal	1.75V	1.7V



BLOCK DIAGRAM OF TDA9830

SAA5254P/T

INTEGRATED VIP AND TELETEXT (IVT1.1X)

GENERAL DESCRIPTION: This complete single page teletext decoder is a derivative from the SAA5244A, it overcomes the one weakness of this device by incorporating automatic packet 26 processing for language extension. The SAA5244A was restricted to the main West European languages since it could only handle 7-bit data, the inclusion of the automatic X/26 processing increases the range of countries to include all those currently transmitting World System Teletext.

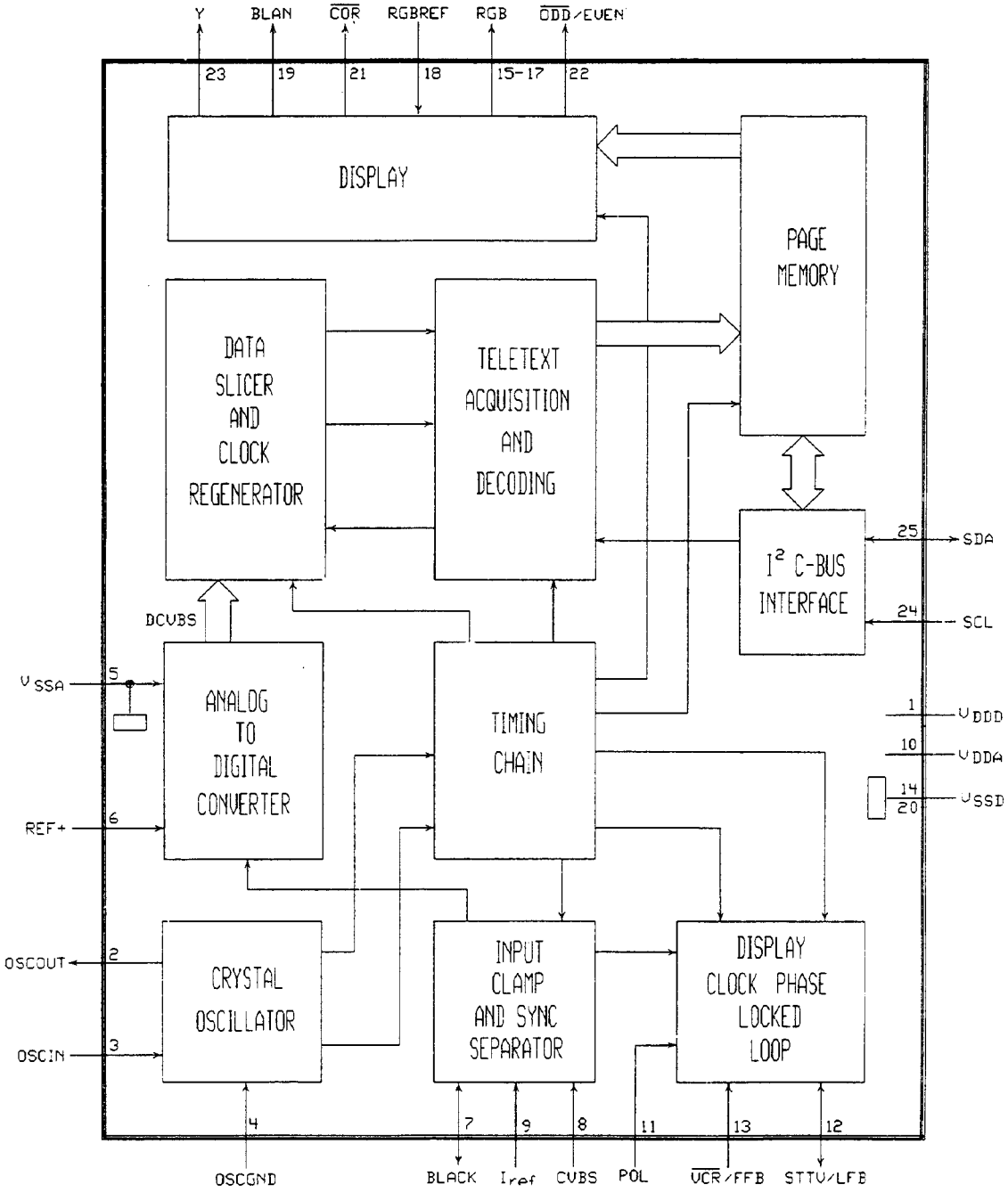
FEATURES

- Completed teletext decoder including page memory and FASTEXT links in a single 40-pin DIL package
- Automatic processing of extension packet 26 for widest possible language decoding.
- 100% hardware-compatible with the SAA5244 - plug-in replacement and extra market.
- 100% software compatible with the SAA5244 - except if the special OSD symbols were used with the SAA5244A.
- Low software overhead for the control microprocessor.
- Wide range of language options will be available :
  - /E West European
  - /H East European
  - /T Euro-Turkish

  Contact IPM for the latest available options.
- Hardware and software compatible to the SAA5249 "Instant" access teletext decoder.

PINNING

	PIN VOLTAGE	
	TV	TEXT
1. VDD +5V digital supply voltage	5V	5V
2. OSCOUT, 27 MHz crystal oscillator output	2V	2V
3. OSCIN, 27 MHz oscillator input	3.50V	3.50V
4. OSCGND, crystal oscillator ground	0V	0V
5. VSS(A), analog ground	0V	0V
6. REF+, Positive reference voltage for the ADC.	5V	5V
7. BLACK, Video black level storage	2.2V	2.2V
8. CVBS, Composite video input	2.5V	2.5V
9. IREF, Reference current input	2.5V	2.5V
10. VDD(A), +5V analog supply voltage	5V	5V
11. POL, STTV/LFB/FFB polarity select	5V	5V
12. STTV/LFB, Sync to TV output pin/line flyback input	1.6V	1.9V
13. VCR/FFB, PLL time constant switch/field flyback input	5V	5V
14. VSS(D), Connected to VSS(D) for normal operation	0V	0V
15. R, Dot rate character output of the RED colour information	0V	0.7V
16. G, Dot rate character output of the GREEN colour information	0V	0.7V
17. B, Dot rate character output of the BLUE colour information	0V	0.7V
18. RGBREF, Input dc voltage to define the output high level on the RGB pins	5V	5V
19. BLAN, Dot rate fast blanking output	0V	3V
20. VSS(D), digital ground	0V	0V
21. COR, Programmable output to provide contrast reduction of the TV picture for mixed text and picture displays or when viewing newsflash/subtitle pages. Open drain circuit	4V	0V
22. ODD/EVEN, 25Hz output synchronized with the CVBS input's field sync pulses to produce a non-interlaced display by adjustment of the vertical deflection currents	0V	2.5V
23. Y, Dot rate character output of teletext foreground coulor information	0V	0V
24. SCL, Serial clock input for I2C-bus.	5V	3V
25. SDA, Serial data port for the I2C-bus.	5V	2.5V
26-40. i.c., Internally connected. Must be left open circuit in application	5V	5V



BLOCK DIAGRAM OF SAA5254P/T

PCA84C641 / PCA84C444

MICROCONTROLLERS FOR CTV 322S (CTV 222S)

GENERAL DESCRIPTION: CTV322S (CTV222S) is a low cost television receiver control system, based on the PCA84C641 (PCA84C444) mikrocontroller. It is a voltage synthesis tuning (VST) system. The control functions of the system are displayed via the on-screen display circuitry of the microcontroller. Herewith two independent lines of 16 characters with 4 different sizes and in 7 different colour can be displayed. Sound and picture are controlled by the 5 on-chip digital to analogue converters. This system is colour standard independent.

The PCA84C641-VST is a member of the PCA84CXX CMOS mikrokontroller family. It includes the PCA84C processor core, 6142 bytes of mark-programmable program ROM, 128 bytes of RAM, a multimaster 1 C bus interface, 2 directly testable lines, 17 general purpose bi-directional I/O lines plus 11 function-combined I/O lines, one 14-bit PWM "analog" control, an AFC input (3-bit DAC + comparator) for voltage synthesized tuning (VST), five 6-bit PWM "analog" control outputs, and a display-on-screen (DOS) facility for two lines of 16 characters (max. 64 character types).

The PCA84C444 is a member of the MAB8400/PCF84C mikrocontroller family. It is a one-chip microcontroller with an 8-bit CPU, 4K ROM, 128 bytes RAM, 8-bit timer/event counter and single level, 3-source interrupt structure. It is mounted in a 42 pin shrunk DIL package. Manufactured in CMOS technology and operating from a single supply voltage between 3.5V and 5.5V, it runs at a 10MHz oscillation frequency and contains about 80 single and double byte and cycle instruction. Up to 17 general purpose bidiractional I/O lines and 11 I/O lines with a combained function are available. One 8-bit I/O port can sink up to 10mA and can the refore be used to drive directly a LED display.

FEATURES :

TUNING;

- Voltage synthesis tuning system via 14 bits digital to analogue convertor.
- Automatic search tuning based on analogue AFC signal and on IDENT (Video recognition) signal.
- Tuning in up to 4 different bands.
- Manual search tuning.
- Direct program number entry.
- One and two program nubber entry.
- Step program up and down.
- Last-tuned program registrationand swap function.
- Silent tuning.
- Dark program switching.
- Automatic following per program.

CONTROL;

- Up to 28 local control commands.
- Remote control according the RC-5 world standart.

DISPLAY;

Off-screen LED display of stand-by mode.
On-screen display of :

- Remote control command reception.
- One or two digit program number entry.
- Program sound status line.
- Selected tuner band VHF-1, VHF-3, UHF and VHF-Hyper.
- Analogue tuning bar in search mode and manual/fine tuning.
- Selected external source.
- Store and clear program mode.
- VRT time constand status.
- Selected colour standard mode.
- Sound mute.
- Recall analogue control, store and clear (hard preset) mode.
- Analogue control mode: volume, brightness, colour, contrast, balance, tone, and/or hue.
- Analogue control status bars.
- Selected sleep timer.
- Preduction Service Mode.

SOUND ;

- Volume control in 64 steps (8 steps/second).
- Optional effect control.
- Mute control function.
- Automatic sound muting during tuning or program switching.

VIDEO ;

- Control of brightness, colour, contrast and hue in 64 steps (8 steps/second).
- Colour standart control of two different standards.
- VTR time constand control.
- Additional three button control possibility for all analogue colour and sound controls.

PERI-TV ;

- Full peripheral TV plug signal switching: CVBS out, CVBS/RGB in, sound in and out.

MEMORY ;

- Storage of preferred analogue picture and sound control setting.
- Storage of 40 or 90 preferred programs.
- Storage of 14 bit tuning DAC value, band select, system standard, dual laguage selection, following enable and VRT time constand control bits for each program.
- Storage VRT time constand system and dual language selection for peripheral audio/video source.

OPTIONS ;

- Theree band, four band or UHF-only tuner.
- Different tuner and AFC characteristics.
- Stereo, dual language or mono sound control.
- Sound affect control.
- Peripheral audio/video TV plog control.
- Signal/Dual system standard control.
- VTR time constand control.
- 40 or 90 pre-programmed preferred channels, reqüiring 128 bytes or 256 bytes of NV=memory.
- AC mains supply control via solenoid on mains switch.
- Analogue control of hue, contrast, balance and/or tone.
- On Screen Display in symbols or text strings with or without background.
- Four or five anaologue controls.

POWER-ON ;

- Main switch sense input to check whether TV has to be switched-on or to standby mode.
- The program provides a fixed delay of 1.2 seconds and screen blanking about 100 msec to allow to switch-mode power-supply to stabilize.
- After power-on reset of the microcontroller and first time switching-on of the set, the system tunes to program 1 and recalls analogue picture and sound control presets from non-volatile memory. If program 1 is "cleared", the system tunes to the first "stored" program. If allprograms ar e "cleared" the program number is forced to 1.

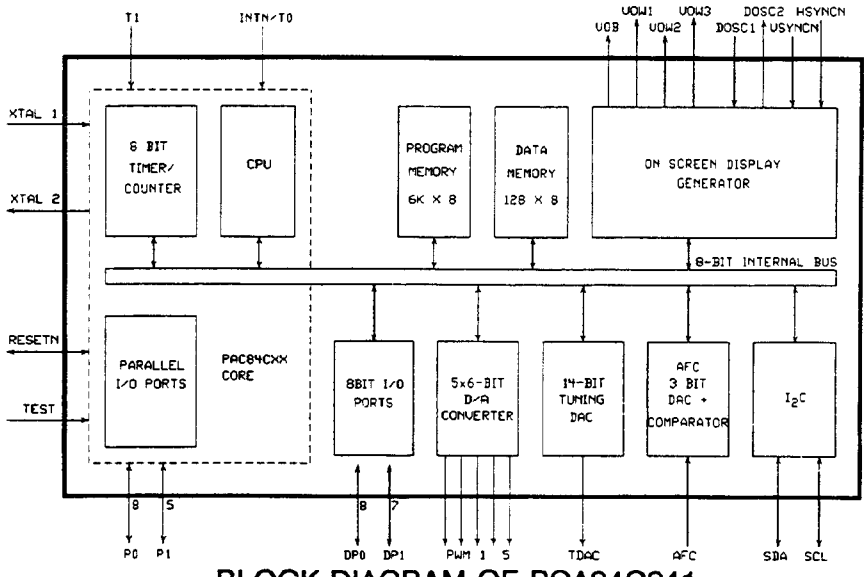
STANDBY ;

- Sleep timer selection of 15, 30, 45, ... up to 120 minutes.
- Automatic switching to standby mode when the system is in front-end mode and during the last five munites no valid input signal is received or no valid remote or local control command is dedected. (All complete received commands with system address 00, except the "RC-5 enlarged" commands, will restrart the 5 minutes timer. All these commands will also result in an OSD message). With additional hardware it is possible to switch off the mains supply voltage completely, e.g. via a solenoid.

TELETEXT (These functions only for CTV322S) :

- Either : a page teletext control system by means of SAA5244. All normal teletext are available. A special signal for de-interlace purposes is available on a sigle output pin.
- Or : a 4 page teletext control system with SAA5246. All normal teletext functions are available. Also here a special signal for de-interlace purposes is available on a single output pin.
- Or : a 4 page teletext control system by means of the SAA5243 (EECT) + SAA5231 (VIP). All normal teletext functions are available. A special PON (Picture On) signal can be combined with an odd/even signal for de-interlace purposes.

PINNING	PIN VOLTAGE
1- Tuning voltage control output	: 5V(Front of band) 0V (End of band)
2- Volume control output	: 0 - 5V
3- Brightness control output	: 0 - 5V
4- Colour control output	: 0 - 5V
5- Contrast or hue control output	: 0 - 5V
6- Tone, balance or hue control output	: -
7- Band-switch 0 output	: -
8- Band-switch 1 output	: -
9- Analogue AFC sense input	: 5V
10- Dual/Non Dual language sound input	: -
11- VTR time constand control output	: -
12- Ext./int. audio/video source control output	: 5V (TV) - 0V (AV)
13- Keyboard scan line input/output	: -
14- Keyboard scan line input/output	: -
15- Keyboard scan line input/output	: -
16- Keyboard scan line input/output	: -
17- Keyboard scan line input/output	: -
18- Keyboard scan line input/output	: -
19- Keyboard scan line input/output	: -
20- System mode strobe output	: 5V
21- Ground supply input	: -
22- OSD red output	: -
23- OSD green output	: -
24- OSD blue output	: -
25- OSD fast blanking output	: -
26- Horizontal synchronization input	: -
27- Vertical synchronization input	: -
28- LC oscillator input for OSD	: 5V
29- LC oscillator output for OSD	: 5V
30- Test input; connected to ground	: -
31- Oscillator input; 10MHz crystal	: -
32- Oscillator output	: 2V
33- Power-on reset input/output	: 5V
34- Horizontal coincidence input	: 4.5V
35- RC-5 remote control input	: 4V
36- Mono/Stereo or language 1/2 output	: -
37- Sound effect control output	: -
38- System select output	: -
39- I^2C-bus clock signal output	: 5V
40- I^2C-bus data signal output	: 5V
41- Standby/On control input/output	: 0V (ST-BY) - 5V (OPEN)
42- +5V supply voltage input	: 5V



BLOCK DIAGRAM OF PCA84C641

ELECTRONIC COMPONENT PART LIST

POS. LIST NO	VESCODE	DESCRIPTION
	ASSEMBLIES	
	1007062100	ASSY. R/C TRANSMITTER UKV-621 (RC-206
	1003000130	ASSY. TUBE (PHL) 14P A34EAC01*06 / 150U
	1005022040	ASSY.MAIN CHASSIS 08-14P PBGSL
	2038009170	ASSY.CRT BOARD 09D-2 14
	2046301600	ASSY.TELETEXT BOARD
	2042101400	ASSY. SOUND BOARD SL03-3
	CAPACITORS	
C100	3084700056	CAP EL 47UF 6.3V M (4*7MM)
C101	3084790356	CAP EL 4.7UF 16C M
C102	3084790356	CAP EL 4.7UF 16C M
C103	3012241036	CAP MKT 220NF 6.3V J
C104	3012241036	CAP MKT 220NF 6.3V J
C105	3012241036	CAP MKT 220NF 6.3V J
C108	3061020142	CAP SER 1NF 50V K B
C109	3061020142	CAP SER 1NF 50V K B
C110	3061020142	CAP SER 1NF 50V K B
C111	3061020142	CAP SER 1NF 50V K B
C112	3061020142	CAP SER 1NF 50V K B
C113	3061020142	CAP SER 1NF 50V K B
C114	3052700132	CAP SER 27PF 50V J CH
C115	3052700132	CAP SER 27PF 50V J CH
C116	3061020142	CAP SER 1NF 50V K B
C117	3061020142	CAP SER 1NF 50V K B
C118	3061020142	CAP SER 1NF 50V K B
C120	3061020142	CAP SER 1NF 50V K B
C201	3081010356	CAP EL 100UF 16V M
C202	3081010356	CAP EL 100UF 16V M
C203	3061030392	CAP SER 10NF 50V Z F
C204	3061030392	CAP SER 10NF 50V Z F
C205	3061030392	CAP SER 10NF 50V Z F
C206	3211040846	CAP MY 100NF 50V K
C207	3064720142	CAP SER 4.7NF 50V K B
C208	3081000856	CAP EL 10UF 50V M
C209	3081000856	CAP EL 10UF 50V M
C210	3081000856	CAP EL 10UF 50V M
C301	3081000856	CAP EL 10UF 50V M
C302	3211040846	CAP MY 100NF 50V K
C303	3082290356	CAP EL 2.2UF 16V M
C304	3061030392	CAP SER 10NF 50V Z F
C305	3084710356	CAP EL 470UF 16V M
C306	3061030392	CAP SER 10NF 50V Z F
C307	3081000856	CAP EL 10UF 50V M
C308	3051010832	CAP SER 100PF 50V J SL
C330	3211040846	CAP MY 100NF 50V K
C401	3063920142	CAP SER 3.9NF 50V K B
C402	3054790116	CAP SER 4.7PF 50V C CH
C403	3082290356	CAP EL 2.2UF 16V M
C404	3211040846	CAP MY 100NF 50V K
C405	3062230392	CAP SER 22NF 50V Z F
C406	3081000856	CAP EL 10UF 50V M
C407	3064730396	CAP SER 47NF 50V Z F
C408	3064730396	CAP SER 47NF 50V Z F
C409	3211040846	CAP MY 100NF 50V K
C410	3082200356	CAP EL 22UF 16V M
C411	3061020142	CAP SER 1NF 50V K B
C412	3064720142	CAP SER 4.7NF 50V K B
C414	3061040398	CAP SER 100NF 50V Z F
C415	3061040398	CAP SER 100NF 50V Z F
C416	3061020142	CAP SER 1NF 50V K B
C417	3061020142	CAP SER 1NF 50V K B
C418	3061040398	CAP SER 100NF 50V Z F
C419	3064720142	CAP SER 4.7NF 50V K B
C420	3051800832	CAP SER 18PF 50V J SL
C421	3062230392	CAP SER 22NF 50V Z F
C422	3081090856	CAP EL 1UF 50V M
C423	3064720142	CAP SER 4.7NF 50V K B
C424	3062220148	CAP SER 2.2NF 50V K B
C425	3064710142	CAP SER 470PF 50V K B
C427	3062230392	CAP SER 22NF 50V Z F
C428	3081090856	CAP EL 1UF 50V M
C429	3081000856	CAP EL 10UF 50V M
C430	3062230392	CAP SER 22NF 50V Z F
C431	3082290356	CAP EL 2.2UF 16V M
C433	3056800132	CAP SER 68PF 50V J CH
C434	3211040846	CAP MY 100NF 50V K
C435	3211040846	CAP MY 100NF 50V K
C436	3211040846	CAP MY 100NF 50V K
C437	3051010832	CAP SER 100PF 50V J SL
C438	3081000856	CAP EL 10UF 50V M
C441	3061040398	CAP SER 100NF 50V Z F
C442	3061040398	CAP SER 100NF 50V Z F
C443	3012241036	CAP MKT 220NF 63V J
C444	3081000856	CAP EL 10UF 50V M
C445	3061040398	CAP SER 100NF 50V Z F
C446	3061040398	CAP SER 100NF 50V Z F
C447	3082290356	CAP EL 2.2UF 16V M
C448	3061020142	CAP SER 1NF 50V K B
C450	3061020142	CAP SER 1NF 50V K B
C451	3081000856	CAP EL 10UF 50V M
C453	3023330036	CAP KP 33NF 63V J
C455	3032290356	CAP EL 2.2UF 16V M
C456	3081000856	CAP EL 10UF 50V M
C490	3051510836	CAP SER 150PF 50V J SL
C501	3051010832	CAP SER 100PF 50V J SL
C502	3212240836	CAP MY 22ONF 50V J
C503	3211040846	CAP MY 100NF 50V K
C504	3061040398	CAP SER 100NF 50V Z F
C505	3081090856	CAP EL 1UF 50V M
C506	3084790356	CAP EL 4.7UF 16V M
C507	3081090856	CAP EL 1UF 50V M
C508	3084790356	CAP EL 4.7UF 16V M
C509	3062220148	CAP SER 2.2NF 50V K B
C510	3061040398	CAP SER 100NF 50V Z F
C511	3051800832	CAP SER 18PF 50V J SL
C512	3051800832	CAP SER 18PF 50V J SL
C513	3061040398	CAP SER 100NF 50V Z F
C514	3081000856	CAP EL 10UF 50V M
C515	3061040398	CAP SER 100NF 50V Z F
C601	3014721146	CAP MKT 4.7NF 100V K
C602	3214740846	CAP MY 470NF 50V K
C603	3036227038	CAP MKP 6.2NF 1.6KV J
C604	3011041548	CAP MKT 100NF 250V K
C605	3083391356	CAP EL 3.3UF 160V M
C606	3033344038	CAP MKP 330NF 400V J
C607	3083301356	CAP EL 33UF 160V M
C608	3081001456	CAP EL 10UF 250V M
C609	3032243058	CAP MKP 220NF 250V M
C610	3012231136	CAP MKT 22NF 100V J
C611	3212230836	CAPMY 22NF 50V J
C612	3216820486	CAP MY 6.8NF 50V K
C613	3062220148	CAP SER 2.2NF 50V K B
C614	3204094148	CAP SER 4PF 2KV K SL
C615	3051010832	CAP SER 100PF 50V J SL
C701	3064720142	CAP SER 4.7NF 50V K B
C702	3064720142	CAP SER 4.7NF 50V K B
C703	3064710142	CAP SER 470PF 50V K B
C704	3211040846	CAP MY 100NF 50V K
C705	3083390856	CAP EL 3.3UF 50V M
C706	3081020556	CAP EL 1000UF 35V M
C707	3081011056	CAP EL 100UF 63V M
C708	3082210656	CAP EL 220UF 40V M
C801	3031043058	CAP MKP 100NF 250V M AC
C802	3031043058	CAP MKP 100NF 250V M AC
C803	3031043058	CAP MKT 100NF 250V M AC
C804	3201021158	CAP SER 1NF 1KV M B
C805	3201021158	CAP SER 1NF 1KV M B
C806	3201021158	CAP SER 1NF 1KV M B
C807	3201021158	CAP SER 1NF 1KV M B
C808	3101010356	CAP EL 100UF 400V M
C809	3212240836	CAP MY 22ONF 50V J
C810	3013321036	CAP MKT 3.3NF 63V J
C811	3064710142	CAP SER 470PF 50V K B
C812	3084700356	CAP EL 47UF 16V M
C813	3064720142	CAP SER 4.7NF 50V K B
C814	3023335048	CAP PP 33NF 630V K
C816	3032215046	CAP MPP 0.22NF 630V K
C817	3081090856	CAP EL 1UF 50V M
C818	3084701358	CAP EL 47UF 160V M (HR)
C819	3084710856	CAP EL 470UF 50V M (85')
C820	3081000856	CAP EL 10UF 50V M
C821	3081020456	CAP EL 1000UF 25V M
C822	3081000856	CAP EL 10UF 50V M
C823	3082210356	CAP EL 220UF 16V M
C824	3202227458	CAP SER 2.2NF 4KV M
C825	3062240396	CAP SER 220NF 25V Z F
C826	3061040398	CAP SER 100NF 50V Z F
C827	3081010456	CAP EL 100UF 25V M
C828	3062714146	CAP SER 270PF 500V K B
C829	3201021158	CAP SER 1NF 1KV M B
C830	3201021158	CAP SER 1NF 1KV M B
C831	3061040398	CAP SER 100NF 50V Z F
C901	3054710030	CAP SMD 470PF 50V J
C902	3055610030	CAP SMD 560PF 50V J
C903	3053910030	CAP SER SMD 390PF 50V J
C904	3055610030	CAP SMD 560PF 50V J
C905	3055610832	CAP SER 560PF 50V J SL
C906	3055610030	CAP SMD 560PF 50V J
C907	3201021158	CAP SER 1NF 1KV M B
C909	3081010356	CAP EL 100UF 16V M
C910	3058210030	CAP SMD 820PF 50V J
C911	3058210030	CAP SMD 820PF 50V J
C912	3058210030	CAP SMD 820PF 50V J
C1101	3061040230	CAP SMD 100NF 50V K R

POS.	VESCODE	DESCRIPTION
C1102	3012231136	CAPMKT 22NF 100V J
C1103	3081000856	CAP EL 10UF 50V M
C1104	3061040230	CAP SMD 100NF 50V K R
C1105	3051030090	CAP SR SMD 10PF 50V
C1106	3051530030	CAP SMD 15PF 50V J
C1107	3061040230	CAP SMD 100NF 50V K R
C1108	3061040230	CAP SMD 100NF 50V K R
C1109	3061040230	CAP SMD 100NF 50V K R
C1110	3081000856	CAP EL 10UF 50V M
C1111	3012231136	CAPMKT 22NF 100V J
C1112	3081000856	CAP EL 10UF 50V M
C1113	3081010856	CAP EL 100UF 16V M
C1116	3014741036	CAP MKT 470NF 63V J
C1117	3014741036	CAP MKT 470NF 63V J

DIODES

	3515520800	INRARED FOR R/C (D=5)
D101	3531941480	DIODE 1N4148
D102	3531941480	DIODE 1N4148
D103	3531941480	DIODE 1N4148
D104	3531941488	DIODE 1N4148 SMD
D201	3531941480	DIODE 1N4148
D202	3531941480	DIODE 1N4148
D301	3551940070	DIODE 1N4007 ITT
D402	3531941480	DIODE 1N4148
D501	3531941480	DIODE 1N4148
D502	3531941480	DIODE 1N4148
D503	3531941480	DIODE 1N4148
D504	3531941480	DIODE 1N4148
D505	3531941480	DIODE 1N4148
D506	3531941480	DIODE 1N4148
D507	3531941480	DIODE 1N4148
D508	3531941480	DIODE 1N4148
D509	3531941480	DIODE 1N4148
D510	3531941480	DIODE 1N4148
D511	3531941480	DIODE 1N4148
D512	3531941480	DIODE 1N4148
D513	3531941480	DIODE 1N4148
D514	3571903600	DIODE ZENER 3.6V ZPD
D601	3531941480	DIODE 1N4148
D602	3531941480	DIODE 1N4148
D603	3551900330	DIODE BYD33J ITT
D604	3551901570	DIODE BA157 MIC
D701	3551900330	DIODE BYD33J ITT
D801	3551940070	DIODE 1N4007
D802	3551940070	DIODE 1N4007
D803	3551940070	DIODE 1N4007
D804	3551940070	DIODE 1N4007
D806	3531941480	DIODE 1N4148
D807	3531941480	DIODE 1N4148
D808	3551901590	DIODE BA159
D809	3570006200	DIODE ZENER 6.2V
D810	3550827200	DIODE BYV27-200
D811	3551500261	DIODE BYM260
D812	3550827200	DIODE BYV27-200
D813	3571933000	DIODE ZENER 33B UZT 33B
D814	3571905100	DIODE ZENER 5.1V ZPD
D815	3571909100	DIODE ZENER 9V1 ZPD
D816	3570012000	DIODE ZENER 12V
D901	3531941488	DIODE 1N4148 SMD
D902	3551940030	DIODE 1N4003 TA
D903	3551940030	DIODE 1N4003 TA
D904	3551940030	DIODE 1N4003 TA
D905	3531941488	DIODE 1N4148 SMD
D1101	3571905108	DIODE ZENER ZMM 5.1V SMD
D1102	3531941480	DIODE 1N4148
D1103	3531941480	DIODE 1N4148
D1104	3531941480	DIODE 1N4148
D1105	3531941480	DIODE 1N4148
D1106	3531941480	DIODE 1N4148
D1111	3531941488	DIODE 1N4148 SMD
D1106	3531941480	DIODE 1N4148
D1106	3531941480	DIODE 1N4148

INTEGRATED CIRCUITS

IC1	3621530100	IC SAA3010P
IC101	3621550300	IC TDA5030A
IC102	3621598300	IC TDA9830
IC301	3621628220	IC TDA 2822M
IC401	3621583621	IC TDA8362A/N1
IC402	3621546611	IC TDA 4661 V2B
IC403	3621583850	IC TDA8395
IC501	3621504220	IC CTV422M.VE1
IC502	3621624020	IC ST24C02
IC503	3620279100	IC LA7910
IC701	3621536532	IC TDA 3653B/N2
IC801	3621846050	IC TDA4605-2
IC802	3620978080	IC LM7808 MOTOROLA
IC1101	3621552540	IC TDA5254P/T

COILS

L101	4011104512	COIL FIXED 1UH Q45 M-A
L102	4011140011	COIL FIXED 1.47UH
L401	4012106522	COIL FIXED 10UH Q65 K-A
L402	4011680032	COIL FIXED 6.8UH J AXI
L403	5913225000	JUMPER WIRE 0.6MM
L404	5913225000	JUMPER WIRE 0.6MM
L405	5913225000	JUMPER WIRE 0.6MM
L406	4012106522	COIL FIXED 10UH Q65 K-A
L501	4262125026	COIL CHOKE PEAKING 12UH Q50 K
L601	4091411110	COIL LINEARTY 14 224L
L602	5913225000	JUMPER WIRE 0.6MM
L801	4013150017	COIL CHOKE 150UH 0.82A
L901	3821120600	JUMPER SMD 1206
L902	3821120600	JUMPER SMD 1206
L903	3821120600	JUMPER SMD 1206
LT401	4020006031	COIL VIF 38.9MHZ 0=60
LT402	3780105500	FILTER SER TRAP TPS 5.5MHz
L1101	4011477022	COIL FIXED 4.7UH Q70 K-A

TRANSISTORS

Q101	3611908588	TR BC858B SMD
Q102	3611905480	TR BC548B ITT
Q103	3611905480	TR BC548B ITT
Q104	3611905580	TR BC558B ITT
Q106	3611908488	TR BC848B SMD
Q107	3611908488	TR BC848B SMD
Q108	3611908588	TR BC858B SMD
Q109	3611908488	TR BC848B SMD
Q110	3611908588	TR BC858B SMD
Q201	3611905480	TR BC548B ITT
Q301	3611905480	TR BC548B ITT
Q401	3611905480	TR BC548B ITT
Q402	3611905480	TR BC548B ITT
Q403	3611905480	TR BC548B ITT
Q404	3611905480	TR BC548B ITT
Q405	3611905480	TR BC548B ITT
Q406	3611905480	TR BC548B ITT
Q501	3611502400	TR BF240 PHILIPS
Q502	3611905580	TR BC558B ITT
Q503	3611905580	TR BC558B ITT
Q601	3611506390	TR BC639
Q602	3611505060	TR BU506D PHILIPS
Q603	3611905480	TR BC548B ITT
Q604	3611905480	TR BC548B ITT
Q605	3611905480	TR BC548B ITT
Q801	3611800771	TR BUZ77B
Q802	3611502380	TR BD238
Q803	3611903270	TR BC327
Q901	3611508690	TR BF869S
Q902	3611508218	TR BF821 SMD
Q903	3611508690	TR BF869S
Q904	3611508218	TR BF821 SMD
Q905	3611508690	TR BF869S
Q906	3611508218	TR BF821 SMD
Q907	3611908588	TR BC858B SMD
Q1101	3611908488	TR BC848B SMD
Q1103	3611908488	TR BC848B SMD
Q1104	3611908488	TR BC848B SMD
Q1105	3611908488	TR BC848B SMD

RESISTORS

R101	3312730830	RES SMD 1/8W 27K J
R102	3312230830	RES SMD 1/8W 22K J
R105	3314730457	RES CF 1/4W 47K G
R109	3315630830	RES SMD 1/8W 56K J
R110	3311030830	RES SMD 1/8W 10K J
R111	3311020830	RES SMD 1/8W 1K J
R115	3311510830	RES SMD 1/8W 150R J
R117	3312710830	RES SMD 1/8W 270R J
R118	3312710830	RES SMD 1/8W 270R J
R119	3311800830	RES SMD 1/8W 18R J
R120	3316820830	RES SMD 1/8W 6.8K J
R121	3311230830	RES SMD 1/8W 12K J
R122	3311040830	RES SMD 1/8W 100K J
R123	3311030830	RES SMD 1/8W 10K J
R125	3315630830	RES SMD 1/8W 56K J
R130	3311040830	RES SMD 1/8W 100K J
R131	3311030830	RES SMD 1/8W 10K J
R132	3311530830	RES SMD 1/8W 15K J
R133	3311020830	RES SMD 1/8W 1K J
R134	3311040830	RES SMD 1/8W 100K J
R135	3311040830	RES SMD 1/8W 100K J
R137	3311030830	RES SMD 1/8W 10K J
R138	3311020830	RES SMD 1/8W 1K J
R140	3311030830	RES SMD 1/8W 10K J
R141	3318230830	RES SMD 1/8W 82K J
R303	3351002135	RES MO 2W 10R J
R441	3321060456	RES MF 1/4W 10M G

R604	3356812135	RES MO 2W 680R J
R606	3372240237	RES MG 1/4W 220K J
R607	3352222137	RES MO 2W 2.2K J
R706	3321890257	RES MF 1/2W 1.8R G
R711	3364791137	RES FUSE 1W 4.7R J
R716	3316810237	RES CF 1/2W 680R J
R720	3351021137	RES MO 1W 1K J
R801	3382295130	RES WW 5W 2.2R J
R802	3357532137	RES MO 2W 75K J
R803	3352721137	RES MO 1W 2.7K J
R804	3318240237	RES CF 1/2W 820K J
R805	3313341137	RES CF 1W 330K J
R809	3364781137	RES FUS 1W 0.47R J
R812	3356801137	RES MO 1W 68R J
R813	3352211137	RES MO 1W 220R J
R815	3353332137	RES MO 2W 33K J
R816	3374750237	RES MG 1/2W 4.7M J
R817	3362280237	RES FUSE 1/2W 0.22R J
R818	3358222137	RES MO 2W 8.2K J
R819	3362280237	RES FUSE 1/2W 0.22R J
R820	3312210237	RES CF 1/2W 220R J
R823	3312210237	RES CF 1/2W 220R J
R825	3356812135	RES MO 2W 680R J
R826	3374750237	RES MG 1/2W 4.7M J
R828	3351531137	RES MO 1W 15K J
R833	3313910457	RES CF 1/4W 390R G
R843	3313320457	RES CF 1/4W 3.3K G
R901	3311220830	RES SMD 1/8W 1.2K J
R902	3311810830	RES SMD 1/8W 180R J
R903	3821120600	JUMPER SMD 1206
R904	3316840830	RES SMD 1/8W 680K J
R905	3311220830	RES SMD 1/8W 1.2K J
R906	3311520237	RES CF 1/2W 1.5K J
R907	3851531137	RES MO 1W 15K J
R908	3311820830	RES SMD 1/8W 1.8K J
R909	3311810830	RES SMD 1/8W 180R J
R910	3821120600	JUMPER SMD 1206
R911	3316840830	RES SMD 1/8W 680K J
R912	3311220830	RES SMD 1/8W 1.2K J
R913	3311520237	RES CF 1/2W 1.5K J
R914	3851531137	RES MO 1W 15K J
R915	3851002135	RES MO 2W 10R J
R916	3311810830	RES SMD 1/8W 180R J
R917	3821120600	JUMPER SMD 1206
R918	3316840830	RES SMD 1/8W 680K J
R919	3311220830	RES SMD 1/8W 1.2K J
R920	3311520237	RES CF 1/2W 1.5K J
R921	3851531137	RES MO 1W 15K J
R922	3313310830	RES SMD 1/8W 330R J
R923	3313320830	RES SMD 1/8W 3.3K J
R925	3314740237	RES CF 1/2W 470K J
R926	3311010830	RES SMD 1/8W 100R J
R927	3319130830	RES SMD 1/8W 91K J
R928	3311540830	RES SMD 1/8W 150K J
R929	3311220830	RES SMD 1/8W 1.2K J
R931	3811540237	RES CF 1/2W 150K J
R932	3811540237	RES CF 1/2W 150K J
R933	3811540237	RES CF 1/2W 150K J
R952	3314710830	RES SMD 1/8W 470R J
R1101	3313320830	RES SMD 1/8W 3.3K J
R1102	3311000830	RES SMD 1/8W 10R J
R1103	3312730830	RES SMD 1/8W 27K J
R1104	3311030830	RES SMD 1/8W 10K J
R1105	3311020830	RES SMD 1/8W 1K J
R1106	3314720830	RES SMD 1/8W 4.7K J
R1107	3314720830	RES SMD 1/8W 4.7K J
R1108	3314720830	RES SMD 1/8W 4.7K J
R1109	3311020830	RES SMD 1/8W 1K J
R1110	3311020830	RES SMD 1/8W 1K J
R1111	3352702135	RES MO 2W 27R J
R1112	3313330830	RES SMD 1/8W 33K J
R1113	3312230830	RES SMD 1/8W 22K J
R1115	3311010830	RES SMD 1/8W 100R J
R1116	3311010830	RES SMD 1/8W 100R J
R1117	3311020830	RES SMD 1/8W 1K J
R1118	3312230830	RES SMD 1/8W 22K J
R1120	3314730830	RES SMD 1/8W 47K J
R1121	3312230830	RES SMD 1/8W 22K J
R1122	3312230830	RES SMD 1/8W 22K J
R1123	3311040830	RES SMD 1/8W 100K J
R1124	3311030830	RES SMD 1/8W 10K J
R1125	3311030830	RES SMD 1/8W 10K J
R1126	3312730830	RES SMD 1/8W 27K J
R1127	3316220830	RES SMD 1/8W 6.2K J
R1128	3311030830	RES SMD 1/8W 10K J
R1133	3313330830	RES SMD 1/8W 33K J
R1140	3311030830	RES SMD 1/8W 10K J
R1142	3312220830	RES SMD 1/8W 2.2K J
R1143	3312220830	RES SMD 1/8W 2.2K J
R1144	3311020830	RES SMD 1/8W 1K J
R1146	3311020830	RES SMD 1/8W 1K J
R1148	3311020830	RES SMD 1/8W 1K J
R1151	3311020830	RES SMD 1/8W 1K J
R1152	3311020830	RES SMD 1/8W 1K J

WIREWOUNDS

TR601	4050001901	LINE DRIVER TRF 90'
TR602	4030001901	TRF FBT 90'
TR801	4060001100	LINE FILTER 2*27MH
TR802	4040403901	TRF SMPS 14' ELDOR

TRIMMPOTS

VR101	3344721210	RES ADJ 1/6W 4K7 K VER
VR401	3341031210	RES ADJ 1/6W 10K K VER.
VR402	3341031210	RES ADJ 1/6W 10K K VER.
VR701	3344721210	RES ADJ 1/6W 4K7 K VER.
VR702	3341011210	RES ADJ 1/6W 100R K VER.
VR703	3341031210	RES ADJ 1/6W 10K K VER.
VR801	3344721210	RES ADJ 1/6W 4K7 K VER.
VR951	3341021200	RES ADJ 1/6W 1K J HOR.
VR953	3341021200	RES ADJ 1/6W 1K J HOR.

OTHERS

	3971600304	SPEAKER.16R 3W (57*169)
	4400103008	RUBBER PAD TRP08
	4070090003	DEGAUSS COIL 14/15' VDE
MD501	3660923900	PRE-AMP LTM 9239-36
LD501	3511023100	LED RED
F801	3807250050	FUSE 2.5A 250V 5*20MM
PL1004	3861200800	CONN.MALE 8P TUNIK (2008)
PL1007	3861200204	CONN.MALE 2P GRI TUNIK (2052)
PL101	3864020500	PIN F 5P/5MM
PL102	3864010900	PIN F 9P 2.5MM
PL1101	3864010702	PIN F 7P/2.5MM
PL1102	3864010702	PIN F 7P/2.5MM
PL301	3861200201	CONN.MALE 2P TUNIK (2002)
PL601	3861820304	CONN.MALE 3P (EKINLER)
PL602	3861820404	CONN.MALE 4P (EKINLER)
PL701	3861200400	CONN.MALE 4P TUNIK (2004)
PL801	8073022504	RIVED BR 2*5*4.5
PL802	3864010301	PIN 3P (TELESET)
PL901	3861200601	CONN.MALE 6P TUNIK (2006)
PL902	3862021300	SOCKET CRT MININECK METALLO
SC401	3862050004	SOCKET SCART
SW801	4390199010	SWITCH ON/OFF
SW501	4390415000	SWITCH TACT
SW502	4390415000	SWITCH TACT
SW503	4390415000	SWITCH TACT
TH801	3391803000	THERM.PTC DEGAUSS DUAL 250V
TH802	3395022500	THERM.PTC
TU101	3924224301	TUNER KHC2000
X100	3840142900	XTAL RES 429 KHZ
X1001	3840110020	XTAL 10 MHZ
X1101	3840127020	XTAL 27MHz
X1102	3840198310	XTAL 9.8304MHz
X401	3840144310	XTAL 4.433619MHZ
X501	3840110020	XTAL 10MHZ
Z101	3750293500	FILTER SAW OFW9350
Z201	3750219630	FILTER SAW G1963
Z401	3760105500	FILTER CER 5.5MHZ SFE 5.5MB
VL101	4020344031	COIL ADJ 340NH Q40 J

11TP09D-2 CRT MODULE COMPONENT USED FOR 14-15" CRT MODELS

PL902 SOCKET CRT (MININECK) - 3862021300

COMPONENT DIFFERENCES DEPENDING ON CRT TYPES

COMPONENTS USED WITH 14" PHILIPS A34EAC01X06 CRTS

C603 CAP MKP 6.2NF 1.6KV 3.5% - 3036227078
C606 CAP MKP 330NF 400V J - 3033344038
C615 SER 100PF 50V J - 3051010832
R456 RES CF 1.6K 0W25 J - 3311620437
R717 RES CF 1K 0W25 J - 3311020437
L601 LINEARTY COIL 224L/50uH - 4091411110
LOSS COIL 150uH - 4013150017

COMPONENT USED WITH 14" ORION A34JLL90X23 (W) CRTS

C603 CAP MKP 7.8NF 1.6KV 3.5% - 3032827078
C606 CAP MKP 330NF 400V J - 3033344038
C615 CAP SER 47PF 50V J - 3054700836
R456 RES CF 1K2 0W25 J - 3311220437
R717 RES CF 1K 0W25 J - 3311020437
L601 LINEARITE COIL 224/50UH - 4091411110

COMPONENT USED WITH 14" GOLDSTAR A34KPU02XX46 CRTS

C603 CAP MKP 7.5NF 1.6KV 3.5% - 3037527038
C606 CAP MKP 430NF 250V J - 3034341538
C615 CAP SER 100PF 50V J - 3051010832
R456 RES CF 1K2 0W25 J - 3311220437
R717 RES CF 1K 0W25 J - 3311020437
L601 LINEARTY COIL 50UH - 4090109000

COMPONENT USED WITH 15" ORION A36JSW90X01 CRTS

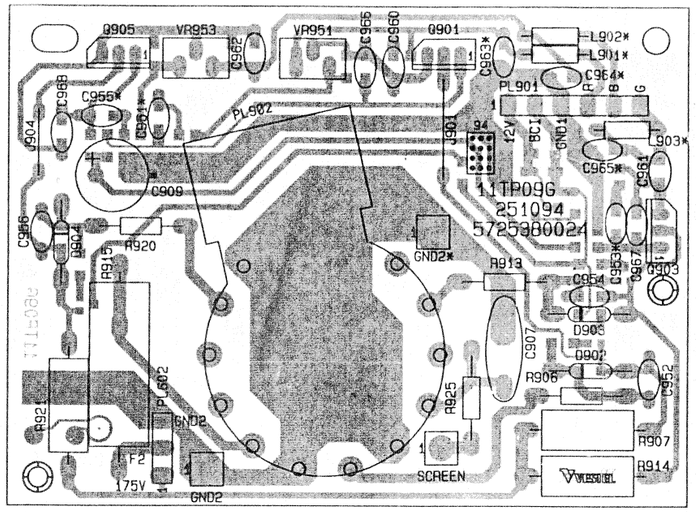
C603 CAP MKP 6.2NF 1.6KV 3.5% - 3036227038
C606 CAP EL 330NF 400V J - 3033344038
C615 CAP SER 100PF 50V J - 3051010832
R456 RES CF 1.6K 0W25 J - 3311620437
R717 RES CF 560R 0W25 J - 3315610437
L601 LINEARITE COIL 15" LIN - 4091611100

11TP09G CRT MODULE COMPONENT USED FOR 14" CRT MODEL

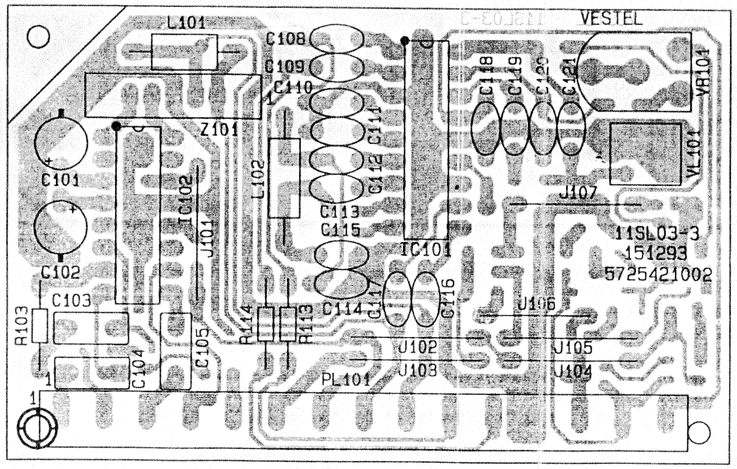
PL902 SOCKET CRT (NARROWNECK) - 3862021010

COMPONENT USED WITH 14" CAIHONG 37SX11OY22-DC05 CRTS

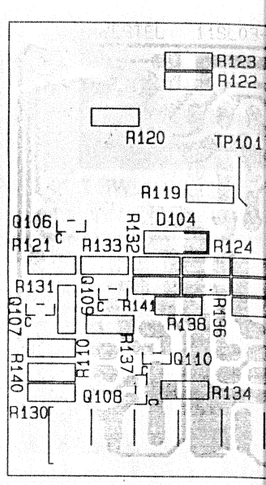
C603 CAP MKP 8.2NF 1.6KV 3.5% - 3038227038
C606 CAP EL 330NF 400V J - 3033344038
C615 CAP SER 47PF 50V J - 3054700836
C901 CAP SMD 680PF 50V J - 3056810030
C903 CAP SMD 560PF 50V J - 3055610030
C905 CAP SMD 1NF 50V J - 3051020030
C910 CAP SMD 1NF 50V J - 3051020030
C911 CAP SMD 1NF 50V J - 3051020030
C912 CAP SMD 1NF 50V J - 3051020030
C913 NOT CONNECTED
C914 NOT CONNECTED
C915 NOT CONNECTED
C916 CAP SMD 220PF 50V - 3052210030
C917 CAP SMD 220PF 50V - 3052210030
C918 CAP SMD 220PF 50V - 3052210030
R456 RES CF 1.2K 0W25 J - 3311220437
R717 RES CF 1K 0W25 J - 3311020437
R902 RES SMD 150R 1/8W J - 3311510830
R909 RES SMD 150R 1/8W J - 3311510830
R916 RES SMD 150R 1/8W J - 3311510830
R907 RES MO 10K 2W J - 3351032137
R914 RES MO 10K 2W J - 3351032137
R915 RES MO 3.9R 3W J - 3353993137
R921 RES MO 10K 2W J - 3351032137
R922 RES SMD 150R 1/8W J - 3311510830
R923 RES SMD 3K3 1/8W J - 3313320830
R926 RES SMD 33R 1/8W J - 3313300830
R931 NOT CONNECTED
R932 NOT CONNECTED
R933 NOT CONNECTED
L601 LINEARITE COIL 224/50UH - 4090109000
LOW FOCUS FBT - 4031001905



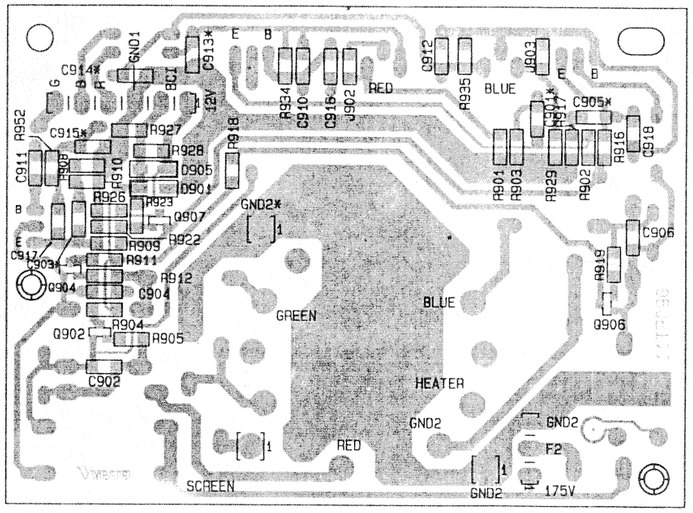
11TP09G CRT MODULE



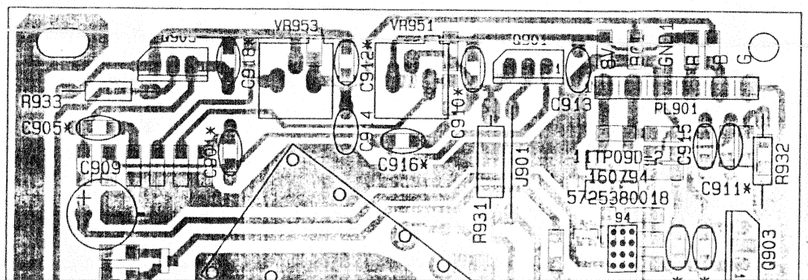
11SL03-3 SECAM-L MODULE

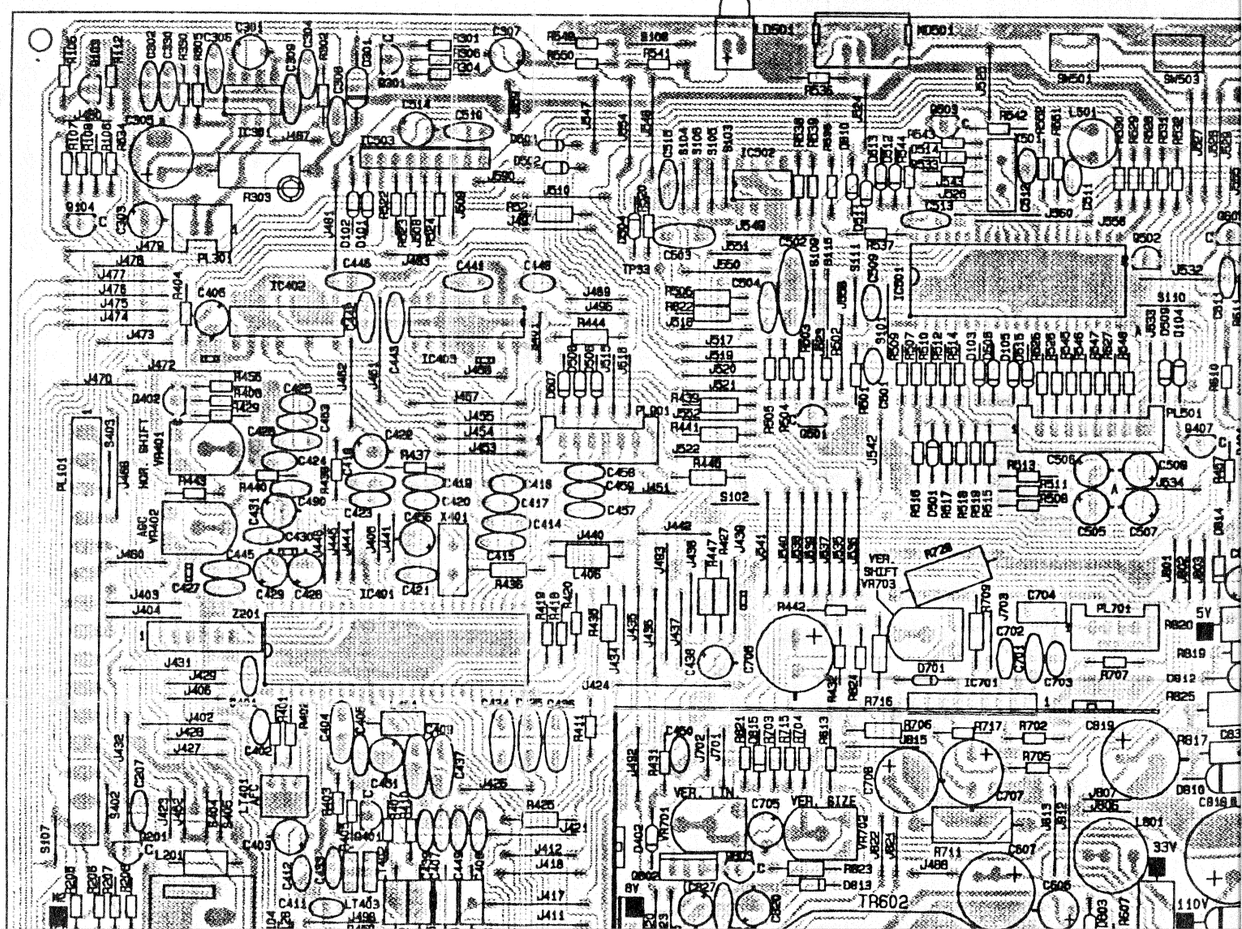


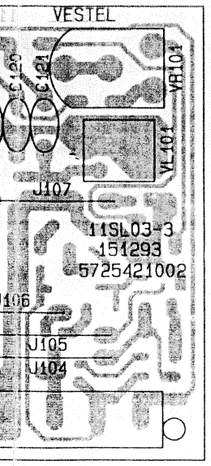
11SL03-3



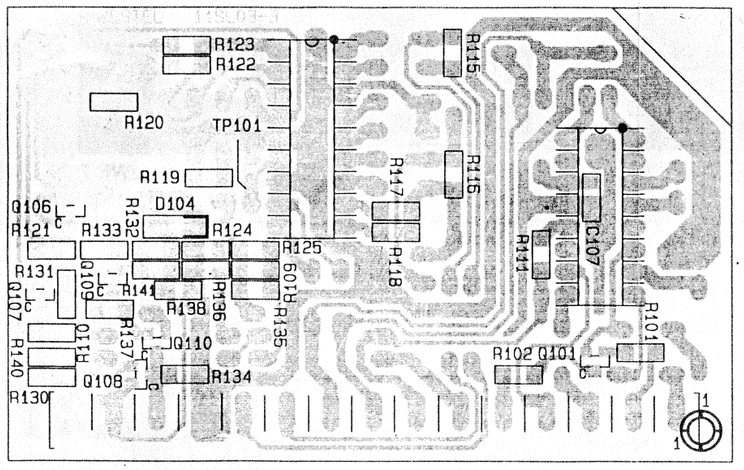
11TP09G CRT MODULE (SMD SIDE)



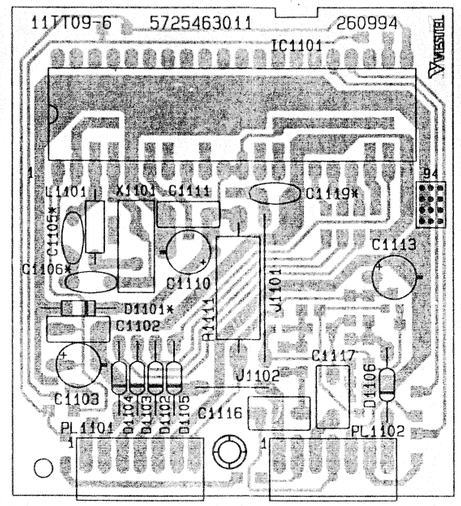




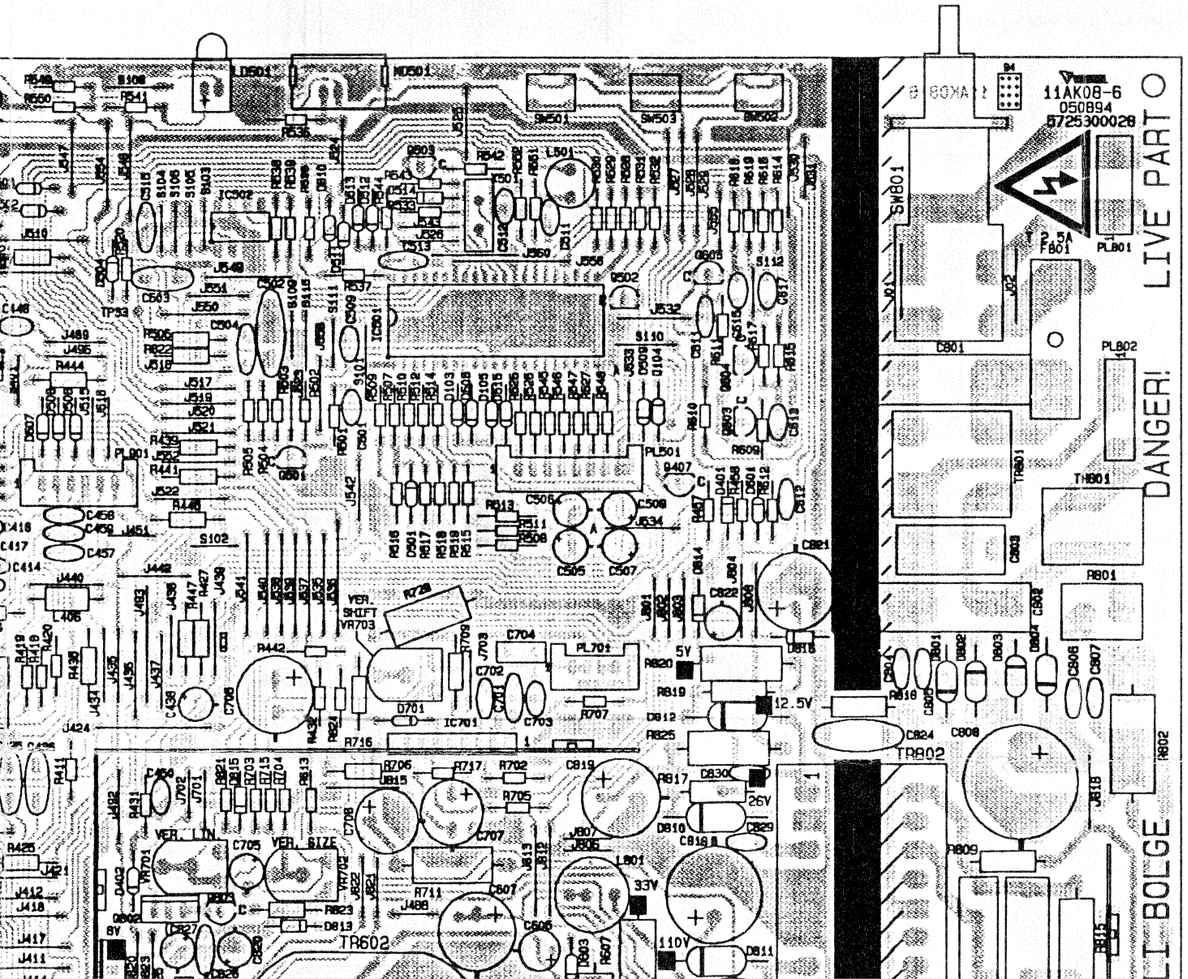
E

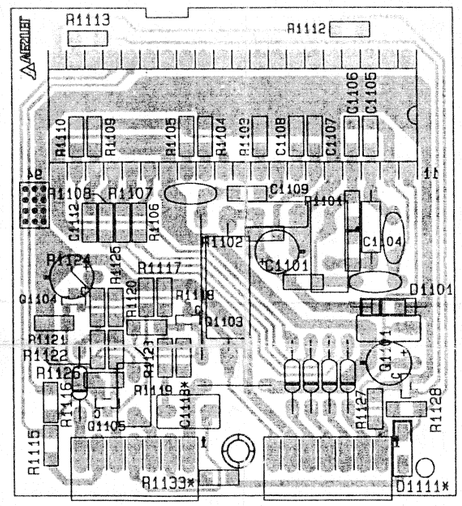


11SL03-3 SECAM-L MODULE (SMD SIDE)



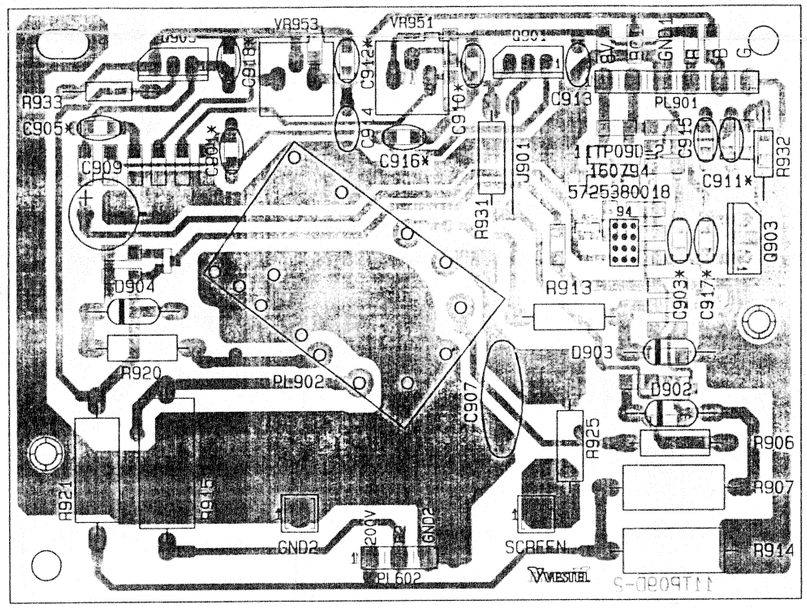
11TT09-6 TELETEXT MODULE



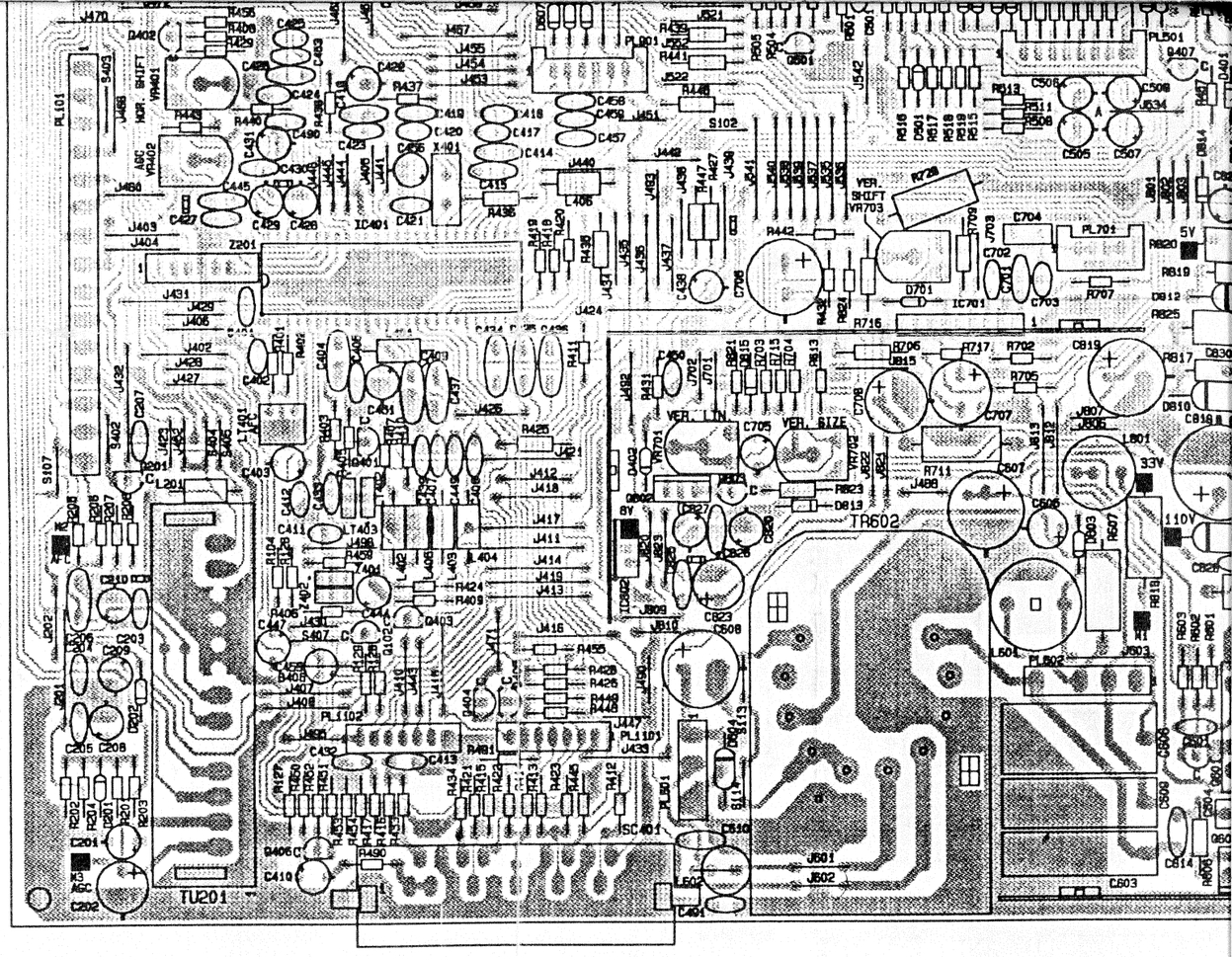


11TT09-6 TELETEXT MODULE (SMD SIDE)

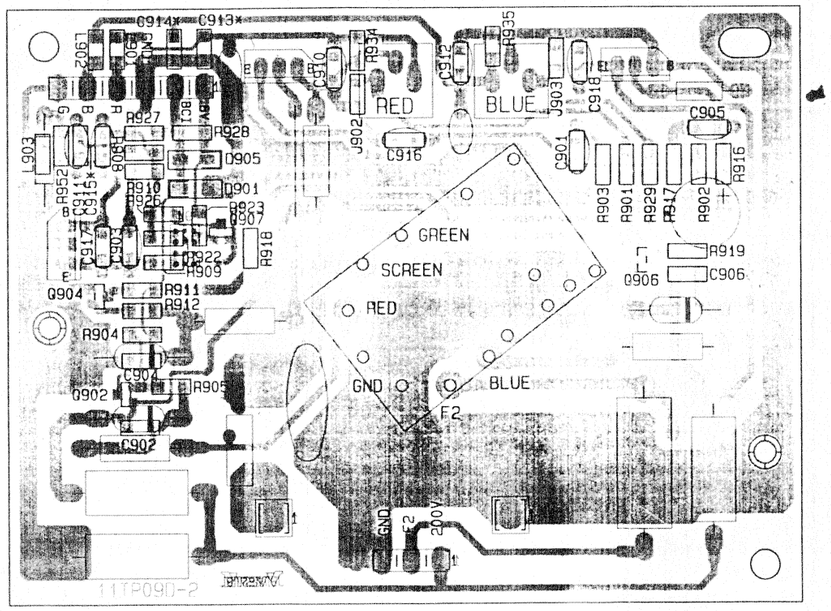
11TP09G CRT MODULE (SMD SIDE)



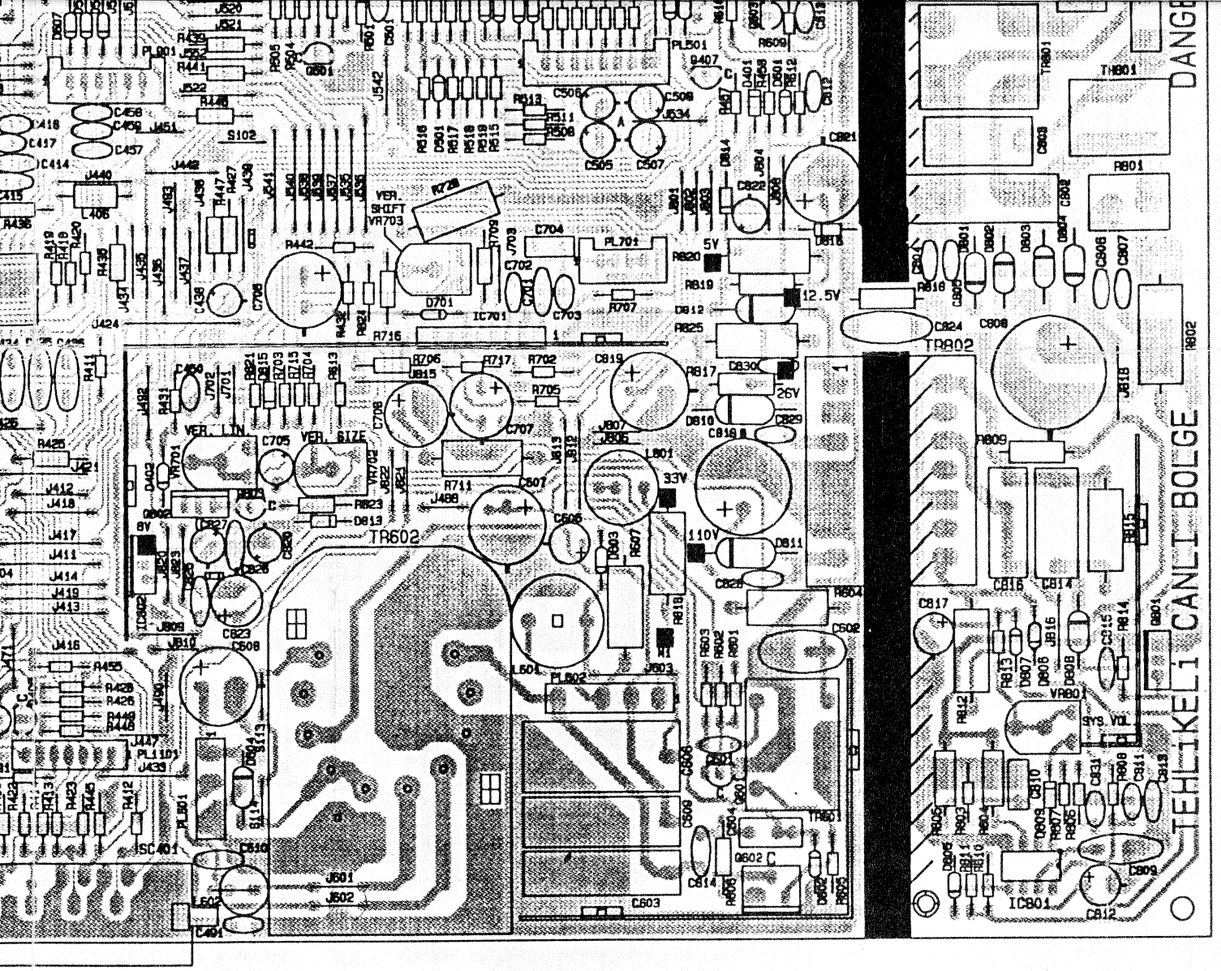
11TP09D-2 CRT MODULE



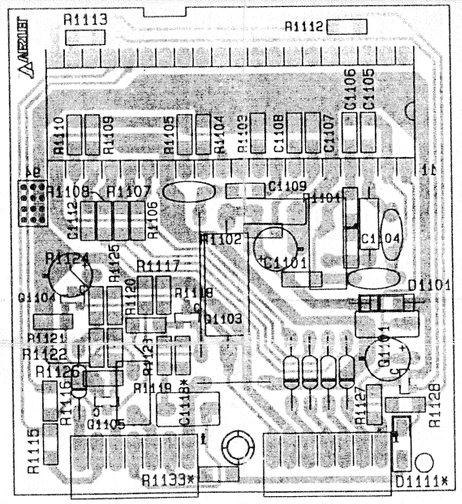
11AK08-6 MAIN BOARD



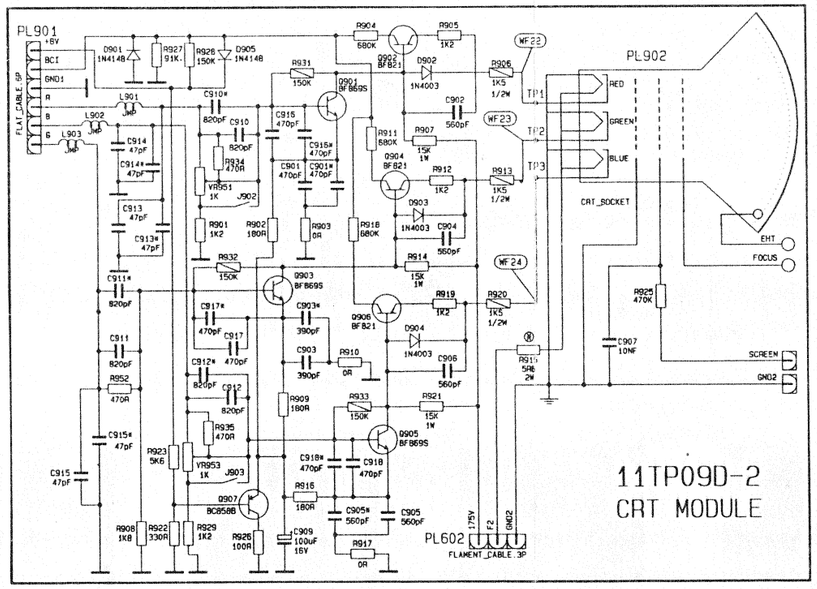
11TP09D-2 CRT MODULE (SMD SIDE)

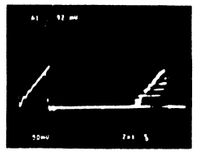


11AK08-6 MAIN BOARD

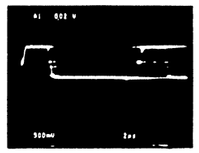


11TT09-6 TELETEXT MODULE (SMD SIDE)

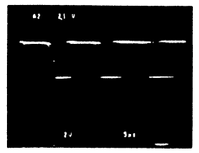




(X10) WF 1

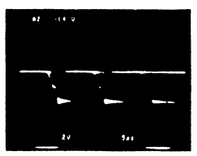


(X10) WF 2

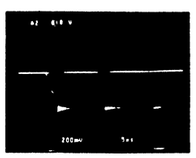


(X100) WF 3

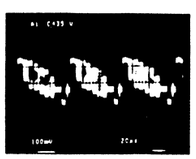
(X10) WF 4



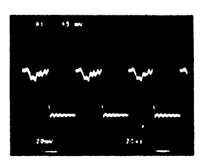
(X100) WF 5



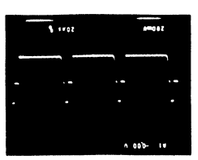
(X100) WF 6



(X10) WF 7

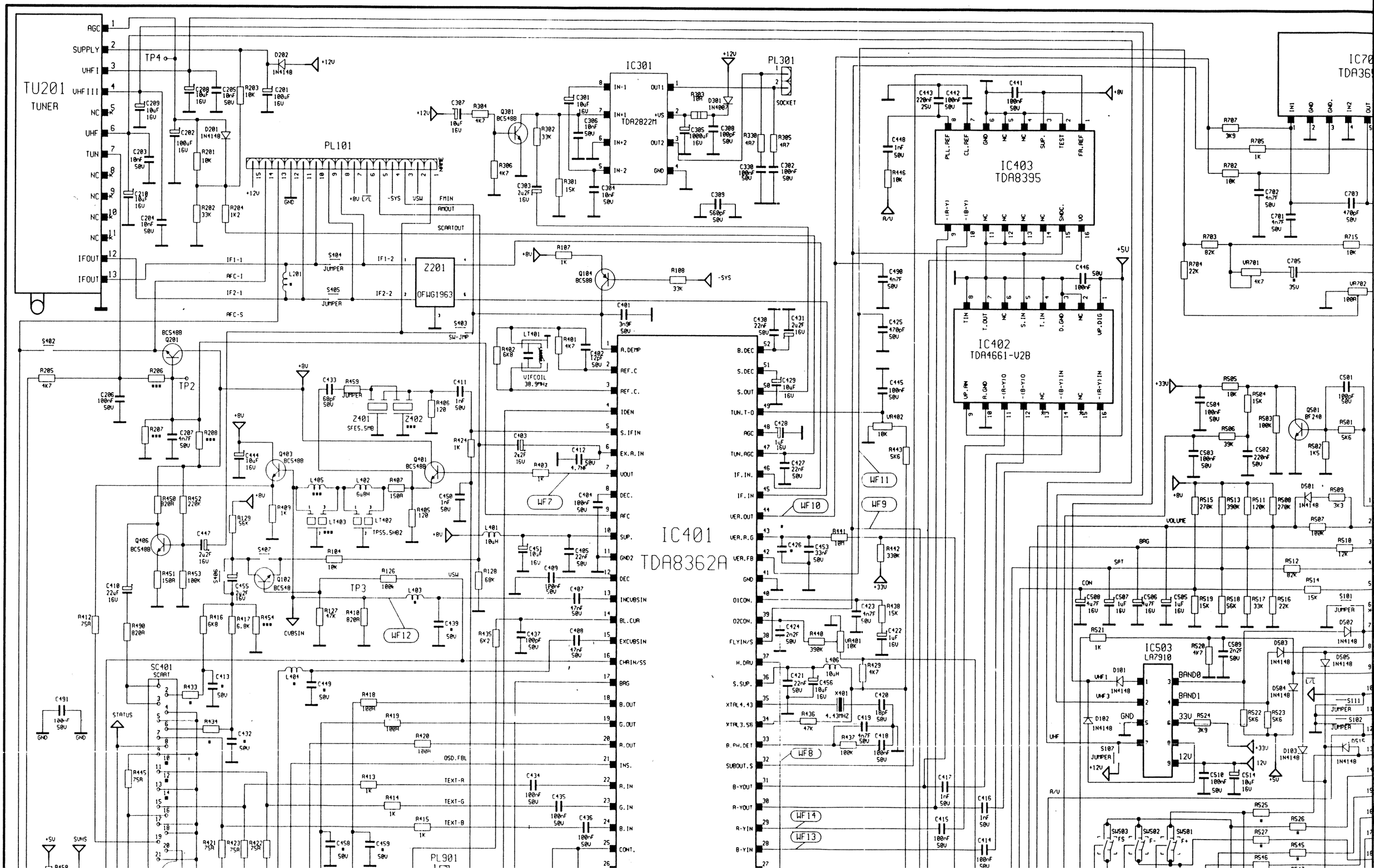


(X10) WF 8



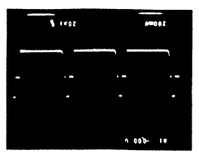
(X10) WF 9

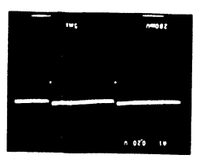
(X10)

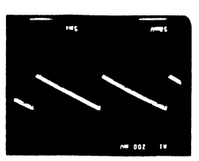


WF 7

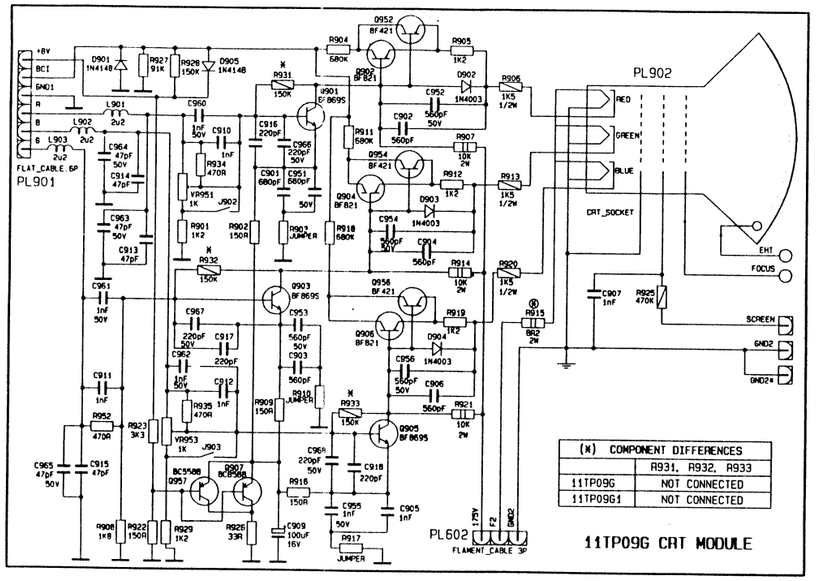
(X10) WF 8

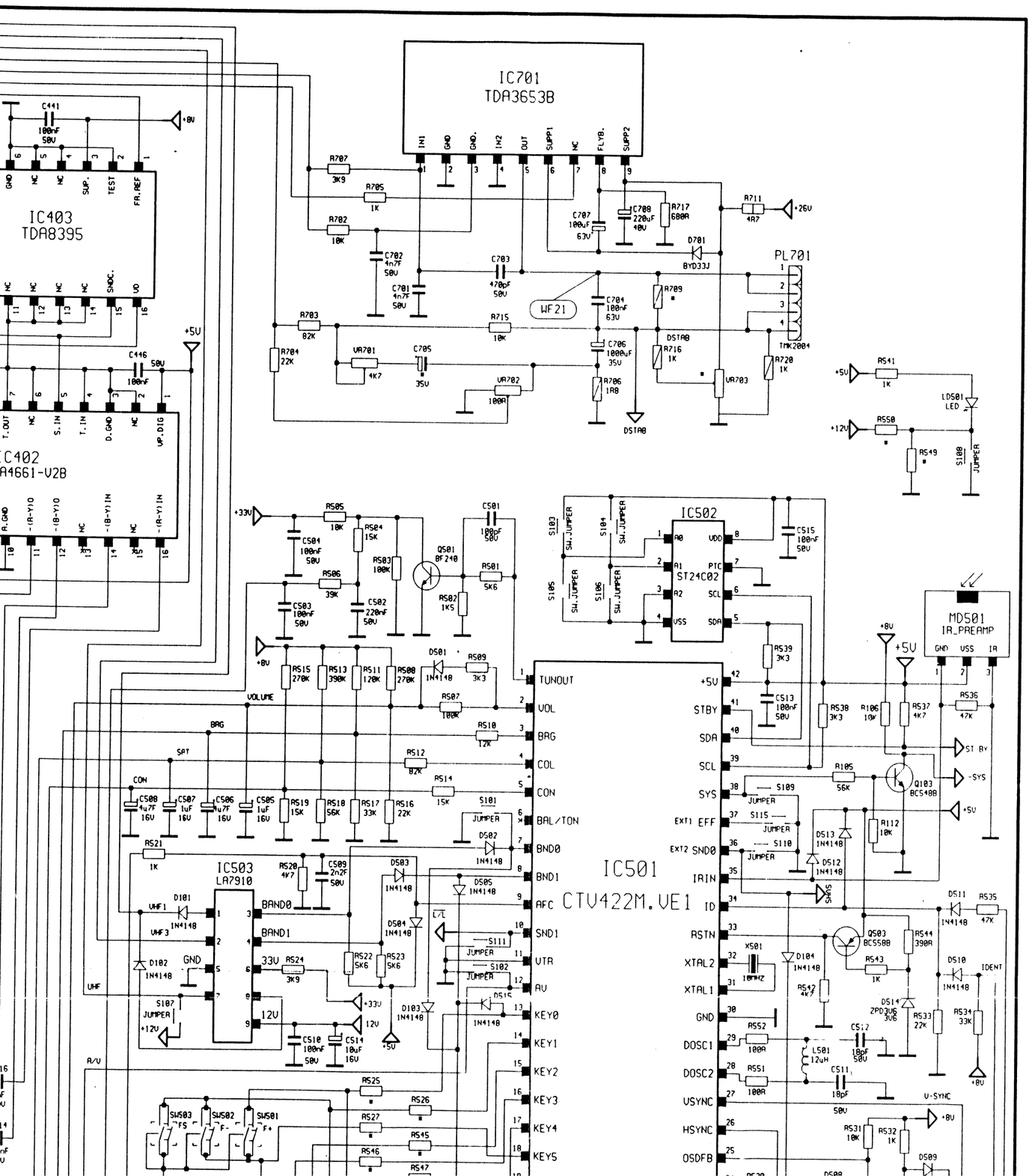

(X10) WF 9

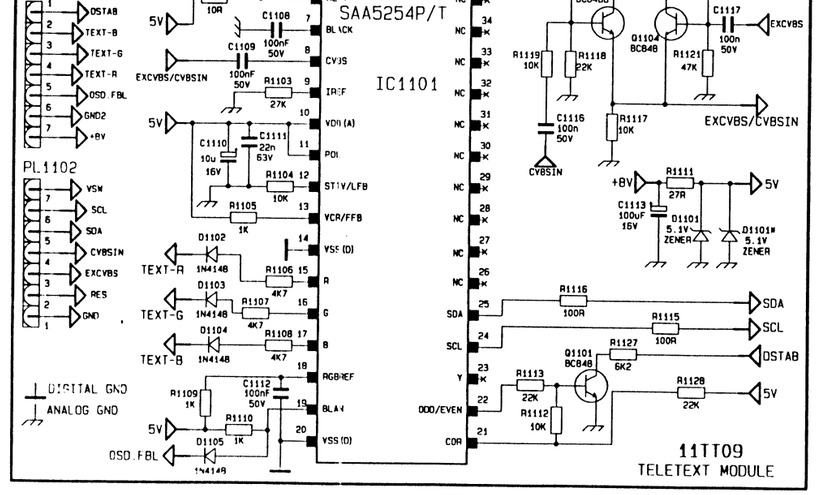

(X10) WF 10

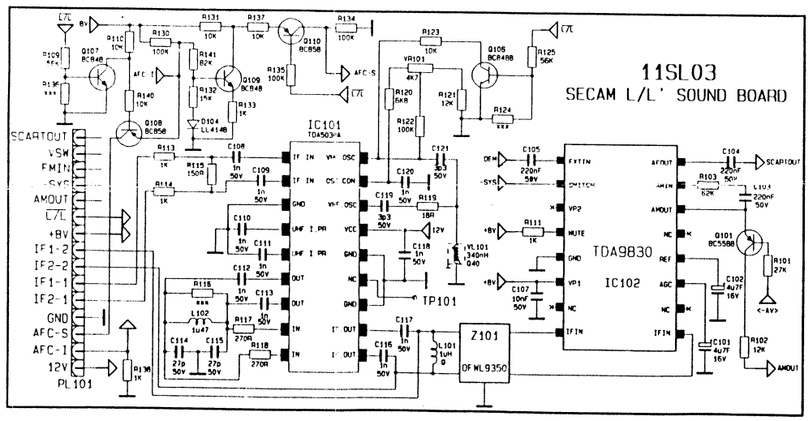

(X10) WF 11

(X10) WF 12









TDA8362A

IC503 LA7910

IC801 TDA4605-2

IC802 LM7808

TR802 SMPS

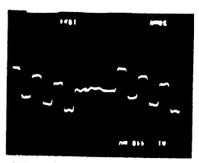
TR801 LINE-FILTER

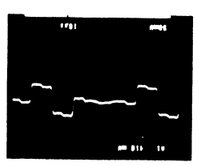
TR601 LDRV

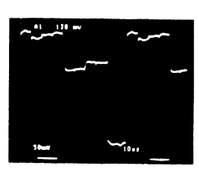
SAFETY COMPONENTS MARKED WITH ⚠ MUST BE REPLACED
WITH ORIGINAL OR APPROVED COMPONENTS ONLY
(ALL PRINTED CIRCUIT BOARDS AND REAR COVER ARE SAFETY COMPONENTS)

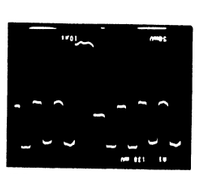
ANTENTION
THE MANUFACTURER RESERVES THE RIGHT TO CHANGE THE DESIGN AND
SPECIFICATION WITHOUT PRIOR NOTICE OR WARNING

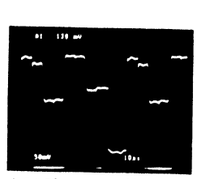
11AK08 M

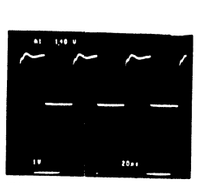

(X10) WF 13


(X10) WF 14

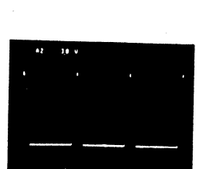

(X10) WF 15

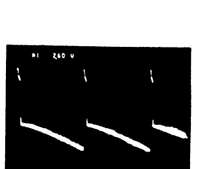

(X10) WF 16


(X10) WF 17

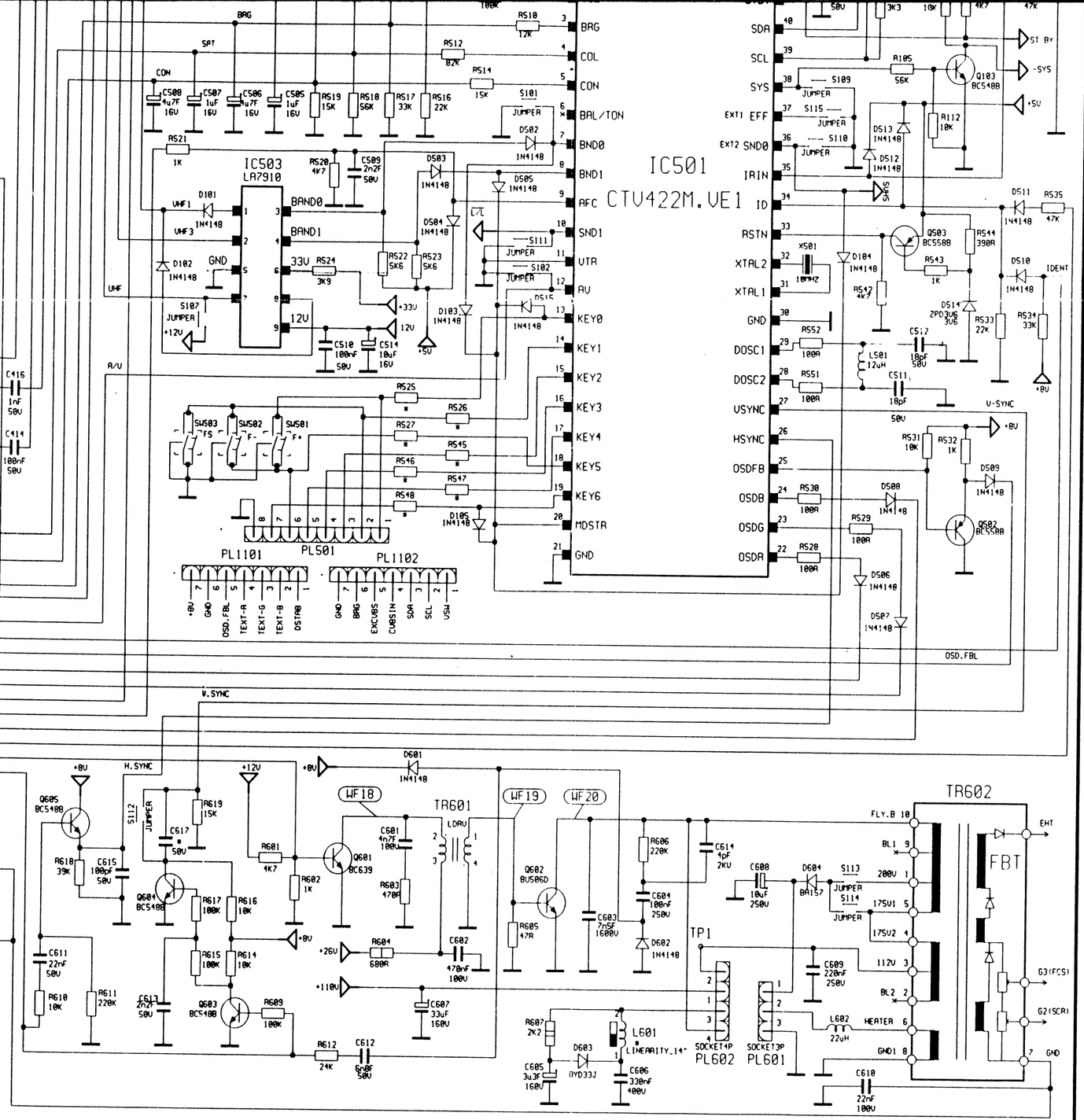

(X10) WF 18

(X10) WF 19


(X100) WF 20


(X10) WF 21

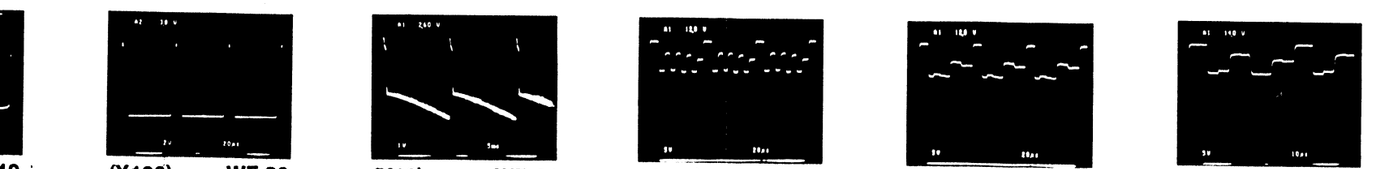
(X100)

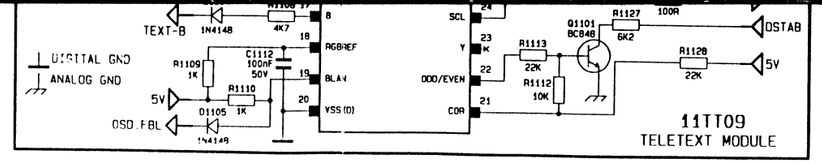


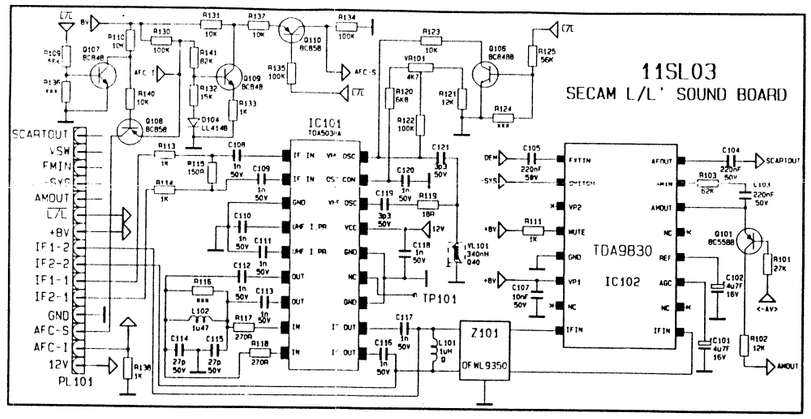
UST BE REPLACED
ONLY
COVER ARE SAFETY COMPONENTS)

HANGE THE DESIGN AND
ARNING

11AK08 MAIN CHASSIS







(*) COMPONENT DIFFERENCES DEPENDING ON SYSTEM								
SYSTEM	Z201	Z401	Z404 LT403	LT402	L405	S401	Q102, Q103, Q104, R104, R105, R106 R107, R108, R112, R128, R129	S109, S402, S403, S404 S405, S406, S407
PAL B/G	OFW 1964	SFE 5.5	N.C	T5.5	JUMPER	CON.	NOT CONNECTED	CONNECTED
PAL I	OFW J 1953	SFE 6.0	N.C	T6.0	JUMPER	CON.	NOT CONNECTED	CONNECTED
PAL SECAM B/G	OFW 1964	SFE 5.5	N.C	T5.5	JUMPER	N.C	NOT CONNECTED	NOT CONNECTED
SECAM D/K	OFW K 2954	SFE 6.5	N.C	T6.5	JUMPER	N.C	NOT CONNECTED	NOT CONNECTED
PAL-SECAM B/G, D/K	OFW K 2954	SFE 5.5	SFE6.5 T6.5	T5.5	COIL 6.8uH	N.C	NOT CONNECTED	NOT CONNECTED
PAL, SECAM, B/G-L/L	OFW 1963	SFE 6.5	N.C	T5.5	JUMPER	N.C	CONNECTED	NOT CONNECTED
SECAM L/L"-K1	OFW J 2950	SFE 6.5	N.C	T6.5	JUMPER	N.C	CONNECTED	NOT CONNECTED

(*) FOR FTZ MODELS OFW G 1963 WILL BE USED.
(*) FOR MODELS WITH SECAM L A 1uF 16V CAPACITOR WILL BE CONNECTED IN PARALLEL WITH R1044.

(*) COMPONENT DIFFERENCES DEPENDING ON CRT									
CRT TYPE	CODE	C603 MKP 1600V/nF	C606 MKP 250V J	R456 CF 1/4W J	R717 CF 1/4W J	C615 SER 50V J	S113 LINK	S114 LINK	L601 L.COIL	LOSS COIL
PHILIPS	A34EAC1x06	6.2nF	*	1K6	1K	100pF	LINK	-	*224L/50uH	150uH
ORION	A34JLL90x23	7.5nF	*	1K2	1K	47pF	LINK	-	*224L/50uH	-
GOLDSTAR	A34KPU02x46	7.5nF	430nF	1K2	1K	100pF	LINK	-	50uH	-
CAIHONG	37SX110Y22-DC05	8.2nF	330nF 400V	1K2	1K	47pF	-	LINK	224L	-
ORION	A51EBV13x01	6.2nF	330nF 400V	1K6	560R	100pF	LINK	-	15" LIN	-

TEXT	J412, J418, J433, J436, J493, J549, J551
WITH TEXT	CONNECTED
WITHOUT TEXT	NOT CONNECTED

SVHS	D104, D401, Q407 R457, R458
WITH SVHS	CONNECTED
WITHOUT SVHS	NOT CONNECTED

(*) COMPONENT DIFFERRENCES DEPENDING ON FEATURES				
AVAILABLE BANDS	TU201	S101 S107	D102 D103	IC503, C204, C205, C208, C209, C510 R522, R523, R524, D503, D504
VHF I-III / UHF	2000 KHC	N.C.	N.C	CONNECTED
ONLY UHF	TFK 3011	CON.	N.C.	NOT CONNECTED
VHF I-III-HYPER/UHF	2000 KHC	N.C.	CON.	CONNECTED

(*) COMPONENT DIFFERRENCES DEPENDING ON FTZ		
	WITH FTZ	WITHOUT FTZ
Z201	OFW G 1963	OFW G 1963
C309	SE 560pF L SL	NOT CONNECTED
C413	SE 820pF 50V KB	NOT CONNECTED
C432	SE 820pF 50V KB	NOT CONNECTED
C439, C449	SE 220pF L SL	NOT CONNECTED
C451, C456	EL 10uF 16V M	NOT CONNECTED
C457, C458, C459	SE 100pFJ SL	NOT CONNECTED
C490	SE 150pF 50V L SL	NOT CONNECTED
C491	SE 100nF Z F	NOT CONNECTED
C801, C802	MKT 150nF 250V AC	MKT 150nF 250V AC
J444, 5, 6	CF 560R 1/4W J	JUMPER
J533	JUMPER	NOT CONNECTED
L201	FIXED COIL 1uH	NOT CONNECTED
L401, L406	FIXED COIL 10uH	JUMPER
L403, L404	FIXED COIL 2.2uH	JUMPER
R433, R434	CF 1K 1/4W J	JUMPER
R490	CF 1K 1/4W J	JUMPER

OTHERS	C426, C452, C815 D105, D805, PL502 R206, R207, R208	R811, L602, R525 R526, R527, R528 R529, R530
	NOT CONNECTED	JUMPER

11AK08		
	TDA8362A N1	TDA8362A N2
R510	15K	12K
R511	120K	27K
R517	22K	18K
R513	270K	470K
R518	27K	47K
R436	47K	8K2